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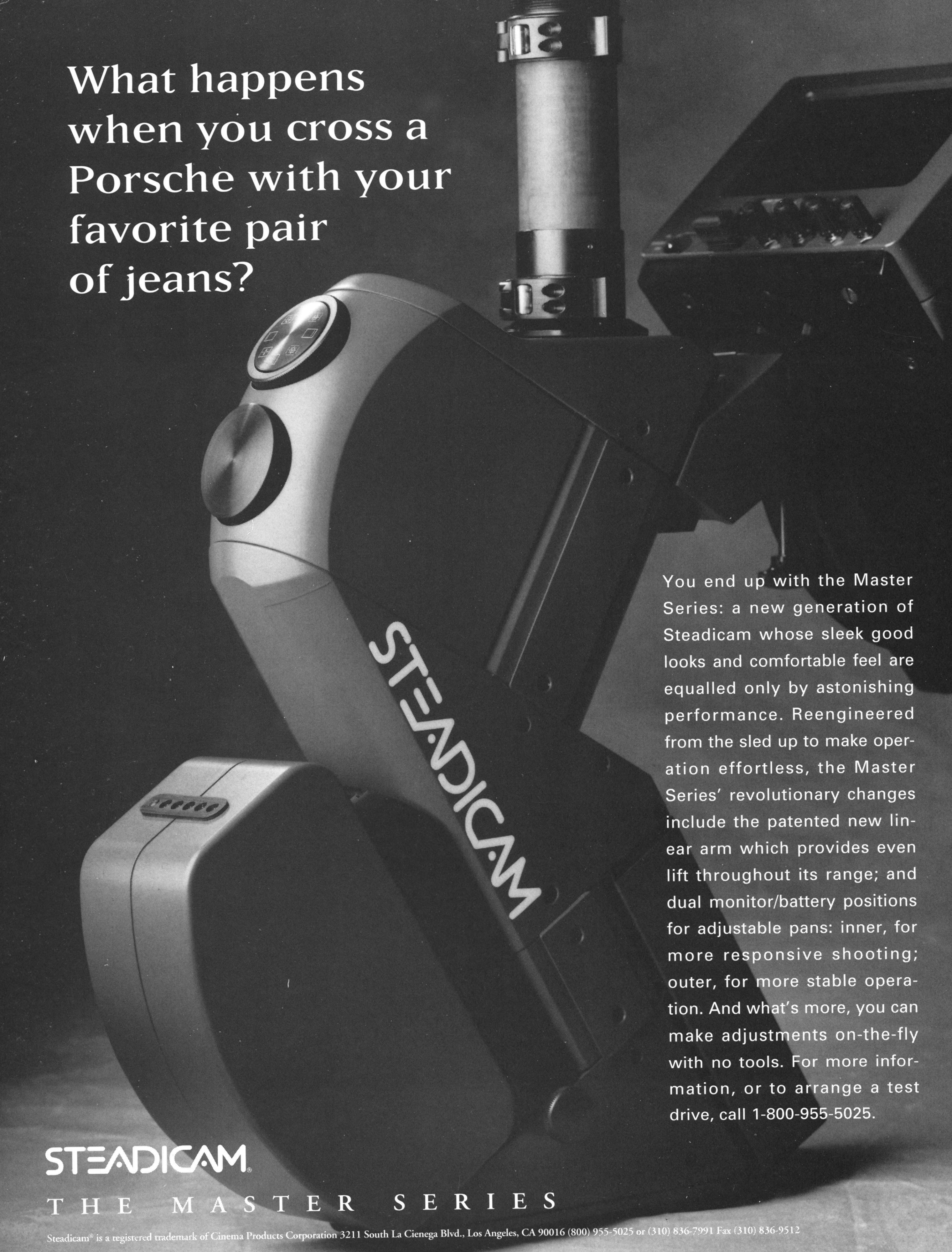
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On Our Cover: A collage of images provided by the MIT Media Lab, where "Movies of the Future" are being explored and developed.

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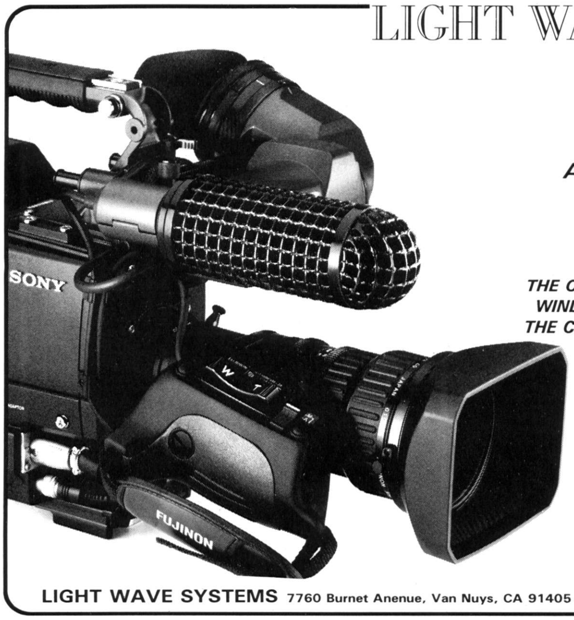

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American **Cinematographer**

April 1995 Vol. 76, No. 4

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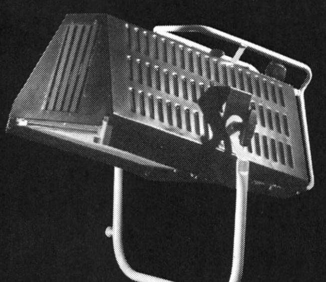
The Goya and the Remington 6000W Par incorporate DeSisti's acclaimed attention craftsmanship and performance. For more information contact your local dealer or DeSisti Lighting.



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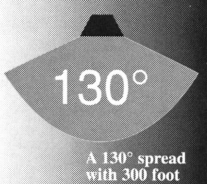

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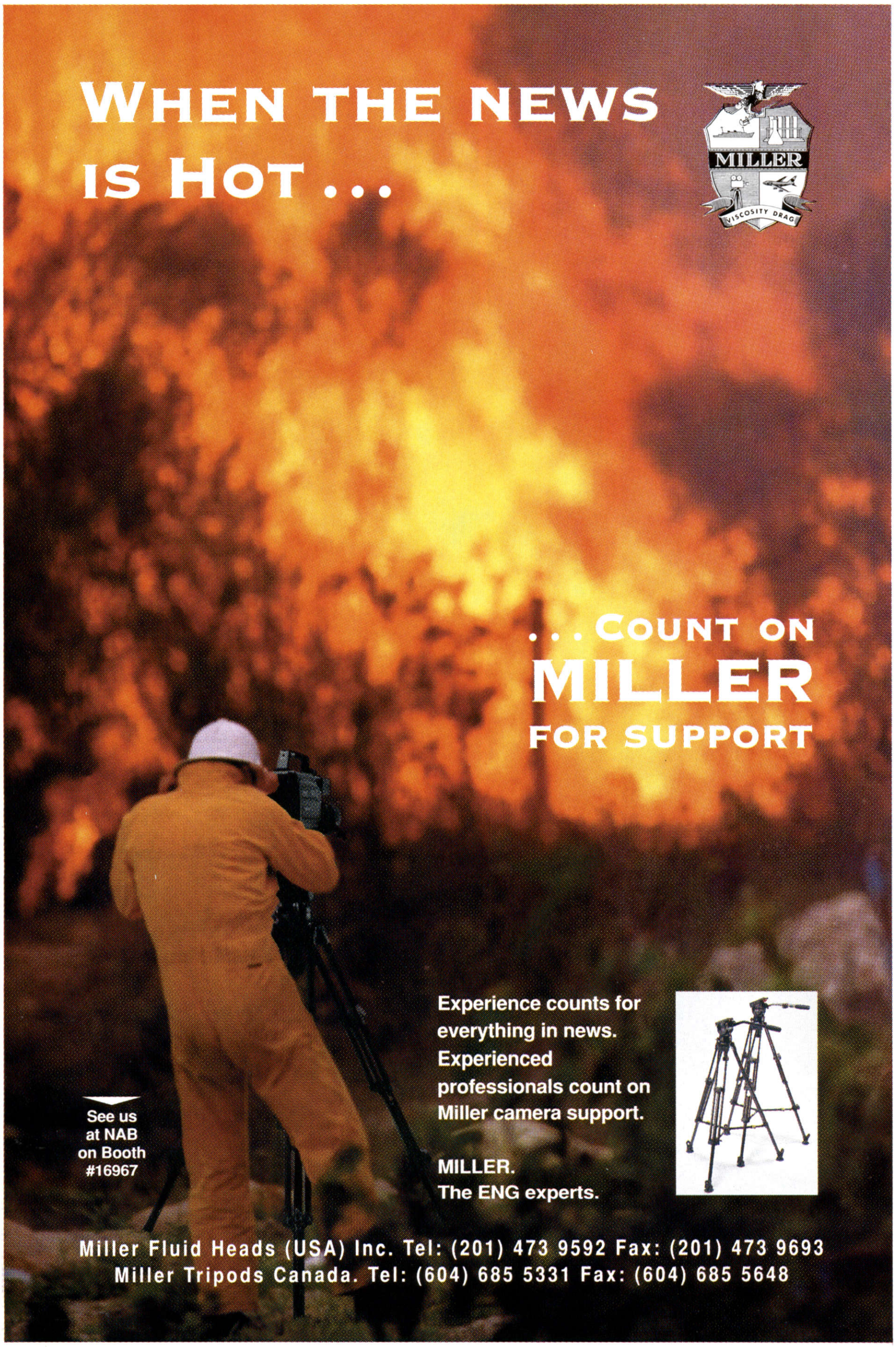

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New at Clairmont: three high-tech VistaVision cameras from Wilcam

Zeiss lenses, mirror shutter,
rotating finder, video tap, 2–200 frames,
tachometer, remote controls,
strobes, crystal sync-sound with no blimp.

We now have three types of VistaVision camera. All made by Wilcam; all state-of-the-art. Ours are the W7, the W9 and the W11. They look similar; the one you see here is the silent-running, sync-sound W11.

High speed, crystal-control

The W7 and the W9 are variable-speed and not silent. The W7 gives you 2 to 200 frames per second, crystal-controlled up to 64 fps, within 0.5% above that. The W9 goes 2 to 100 frames, forward and reverse; all speeds crystal-controlled. Both cameras have tachometer readouts, as well as crystal-sync LEDs.

Eight claws, six register pins

The W9 uses six full-size registration pins and four claws. The W7 has six pins and *eight* claws. On both cameras, the pins use different perfs from those used by the claws, for maximum registration accuracy.

Vacuum back, balanced movement

For best possible film flatness, both cameras employ a vacuum-back pressure plate. To minimize vibration, the 200 fps W7 even has a second, reciprocating movement. It doesn't transport or position the film. It *balances* the transport movement by moving in the opposite direction.

Gentle takeup

With both these high-speed cameras, you don't have to take up film slack by hand. When you throw the Power switch, after threading, torque motors in the magazines slowly take up the slack. The cameras then go into Standby mode. When you throw the Run/Stop switch, both cameras accelerate steadily to the set speed. 0 to 100 fps: 2 seconds. 0 to 200 fps: 2½ seconds.

Even wrap

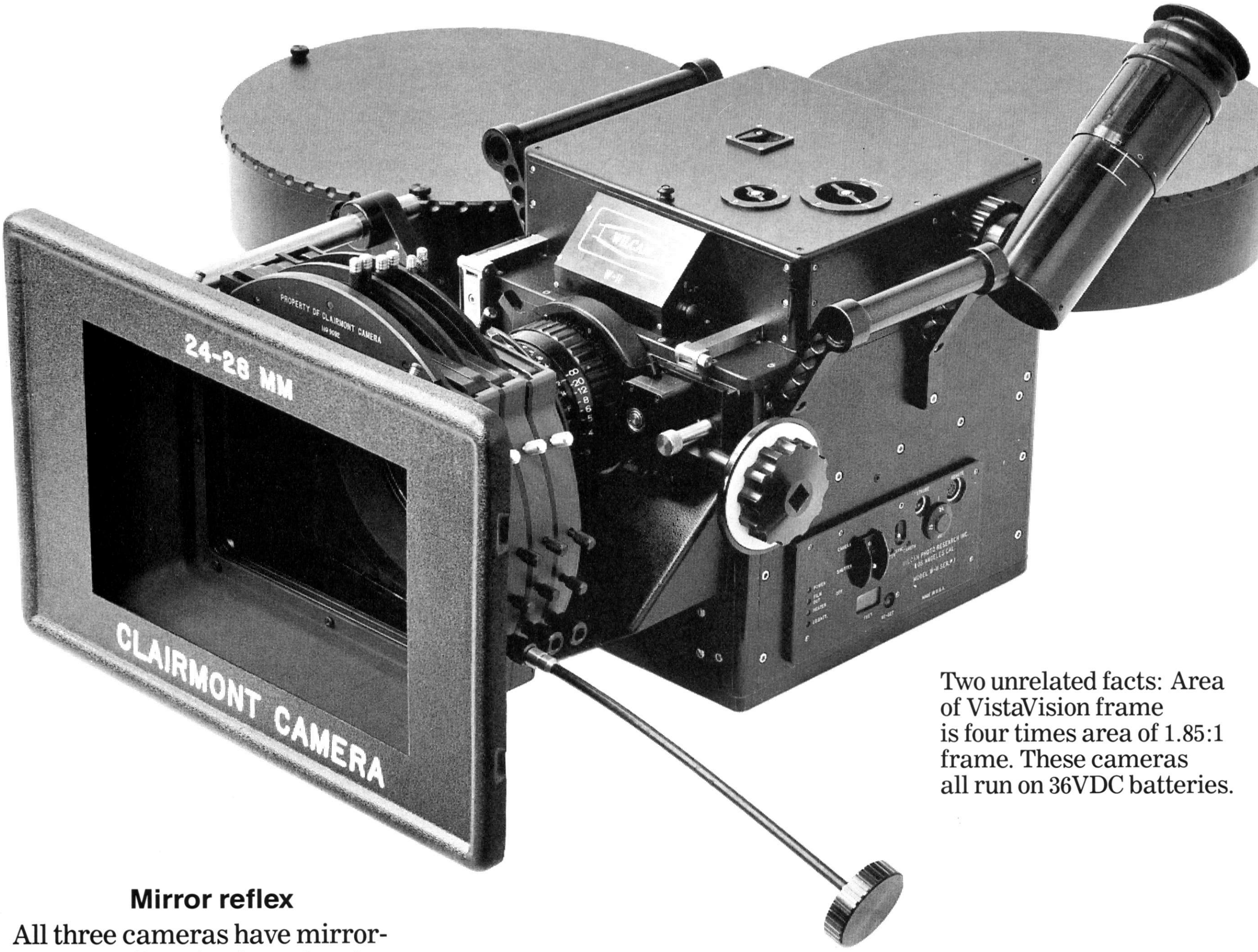
Once at the speed you've selected, sensor arms maintain even tension in the feed and takeup rolls as they change size. At the end of the roll, infrared sensors signal both cameras to stop instantly. Mid-roll stops are fast but also smooth and well-controlled, because of the gear-driven torque motors.

Film path

All three cameras use two 1000 foot magazines: feed on the right side, takeup at the back. All magazines are horizontal, so the film travels horizontally all through the cameras—no twisting. On the silent-running W11, the magazines are belt-driven.

Sync sound

The W11 runs at 24, 25 and 30 fps, crystal sync. At 24 fps, it measures 24dBA or better, 3 meters from the film plane. And it needs no blimp. It uses two claws and six full-size registration pins. The pins use different perfs from those used by the claws. There's a strobe output on the control panel—pulses for film only or for film and finder.



Two unrelated facts: Area of VistaVision frame is four times area of 1.85:1 frame. These cameras all run on 36VDC batteries.

Mirror reflex

All three cameras have mirror-shutter reflex viewing. The viewfinder system and video tap camera are enclosed within the body door. Two eyepiece modes: normal and 10 times magnified. Registered film clip holder at the groundglass. The finder rotates; the image stays upright automatically.

Zeiss lenses

All three cameras have a BNCR lens mount. But the big VistaVision mirror limits flange depth, so you can't use just any BNC mount lens. (And standard BNC mount lenses wouldn't cover the eight perf VistaVision frame.) We have sets of Zeiss fixed lenses: 28mm, 35mm, 50mm, 85mm, 100mm and 135mm. (The 28mm is like a 14mm on four perf 35mm, of course.)

Weights

With 1000 feet of film, two magazines and 50mm lens, weights to nearest pound are W9: 40 lbs, W11: 60 lbs, W7: 102 lbs.

Modern mattebox

As you can see in the photo, these cameras work with a standard gear-driven follow-focus and with the new 6.6 535 mattebox. Its front filter stage is also gear-driven, for moving grads across the frame. That's the flexible control for it, in the foreground.

Experienced

Wayne Baker has been a First Assistant since 1982, specializing in 2nd Unit action, visual effects, aerial and underwater. He has worked with eight types of 65mm camera and six types of VistaVision. "I've used all the weird cameras," he says.

Easiest

"I've worked with VistaVision cameras on which a reload could take fifteen or twenty minutes. Once you're familiar with it, threading the Wilcams is straightforward; reloads take three to five minutes. I find the Wilcam VistaVisions the easiest to work with," says Mr. Baker, "More versatile, faster, more reliable, newer."

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Letters

Less CGI, But More CGI?

I've been a subscriber for five years and enjoy your magazine and most of its articles. I especially think the historical articles are delightful, as well as the articles about low-budget films, from which I've learned a lot.

Regarding the CGI articles in your latest issues, they are interesting in regards to new things in the industry, but too many of those articles make your magazine resemble a version of Computer Graphics World for film. It seems that the magazine will soon be on the same rack at the newsstand as the computer pulp press stuff.

Personally, I agree with the January letter from Mr. K.B. Bassett. On the other hand, I've recently seen a digital 35mm still camera, the Nikon E2 (mentioned in the French magazine *Photo* in October of 1994), with enough resolution for film — 1.3 million pixels. I have a question for the cinematographers and technicians: will we soon see a 35mm "filmless" digital camera? In that case, would it be possible to shoot to laserdisc (or any mega-storage medium), transfer to computers, edit all, add effects and just make the release prints on film? Just imagine even a small computer connected to the camera for "emulsion simulation."

If such a camera is so close to becoming a reality, then you may be very right with the CGI info.

— Javier Diez
Valencia, Spain

I'm writing regarding the letter written by Kevin Bryan Bassett in the January '95 issue. I agree with most of what Mr. Bassett is saying. I too have grown tired of reading about the latest CGI computer program, the latest digital effect, and so on and so on.

I do want to point out that I think it is extremely important to keep your readers up to date on the new tools that are available to the cinematographer, but not to go overboard.

But I'm not too worried; I have faith in *American Cinematographer.*

— Lee Barksdale Vickery
New York, NY

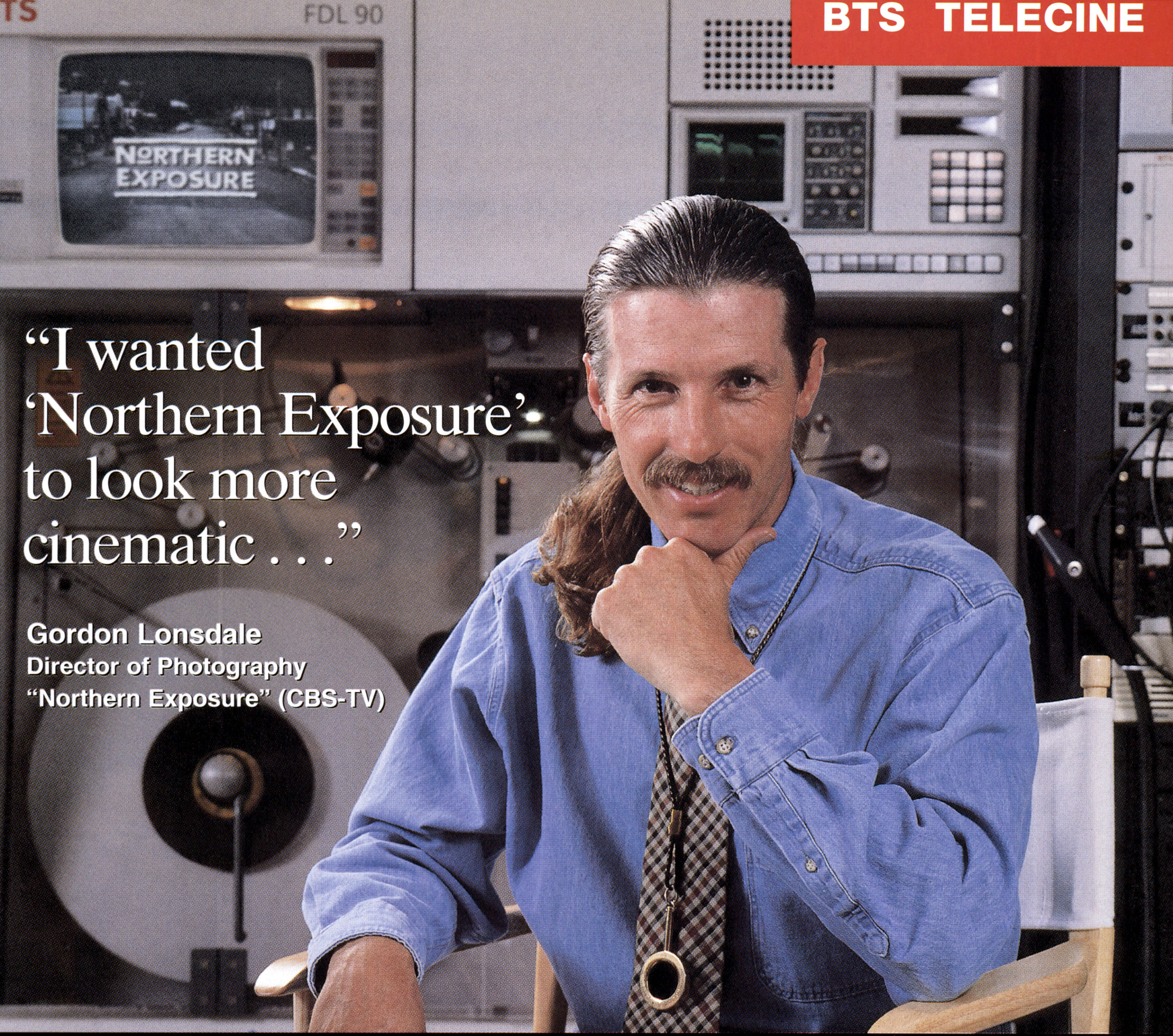
In Praise of John Bailey, ASC

I would like to commend John Bailey, ASC for speaking out against violence in December's Filmmakers' Forum column. It is difficult to take such an unpopular stance in the creative fields, even as a recognized and respected professional. This act is therefore praiseworthy.

As a strong advocate of First Amendment rights, I feel that filmmakers must be allowed to express themselves however they see fit and that nobody should force their individual concept of morality onto anyone. However, we do have a responsibility in general.

The fact that film is such a strong agent of socialization requires us to pay closer attention to what we present. This is not to say that moviegoers will uncontrollably reproduce the violence they observe in films, but it does mean that we are transmitting a form of culture that many people will internalize, and it has our name attached to it as the creators.

Some of today's writers and directors have forgotten the simple rule that everything that happens in the narrative film, whether it be action, dialogue or lighting, is supposed to move the story along. *Jaws* is a film in which every violent action and line of dialogue is relevant to the story's outcome, and the film itself had long-lasting effects on the minds of its viewers: apparently most of the country didn't swim that summer. Unfortunately, more and more of today's films consist of plotless and random acts of brutality masked behind semi-interesting characters and amusing dialogue. If violence is needed, it doesn't always have to be, as Quentin Tarantino's characters have repeatedly put it, "Shooting someone in the face!"



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I am a young person gradually entering the business of film production, hoping soon to be considered a peer of my relatives, who are already established professionals. What kind of future is there in the film world for young people who are concerned with stories for intellectuals and cinematography for the appreciative? What kind of future is there for the media consumer who may soon find his or her choices limited if it is determined that this type of violence merely sells best?

This is a matter of concern for everyone, from the executive producer to production assistant.

— Robert Johnson
University of Virginia

Having just read John Bailey's article "Bang Bang Bang Bang, Ad Nauseum" in the December issue, I must say that I could not agree more. I am so happy that someone has finally stood up and said all of these things [about cinematic violence,] which I think has become a huge concern, especially in the recent past with movies like *Natural Born Killers*, *Pulp Fiction*, and *True Romance*.

What is all this gratuitous, unjustified and unnecessary violence about? Quentin Tarantino is arguably a good dialogue writer and possibly in technical terms a good director, but undoubtedly he must be a very disturbed and poor soul. Why do the power brokers green-light these kinds of movies? I don't want to believe it is simply for box office, because there are millions of stories out there that would do much better. *Forrest Gump* is a good example.

It all starts with and boils down to what John Bailey says: "I believe we have a great responsibility to the people who see the images we create. . . Film is arguably the most influential of all the arts; it is the art form of choice for young people."

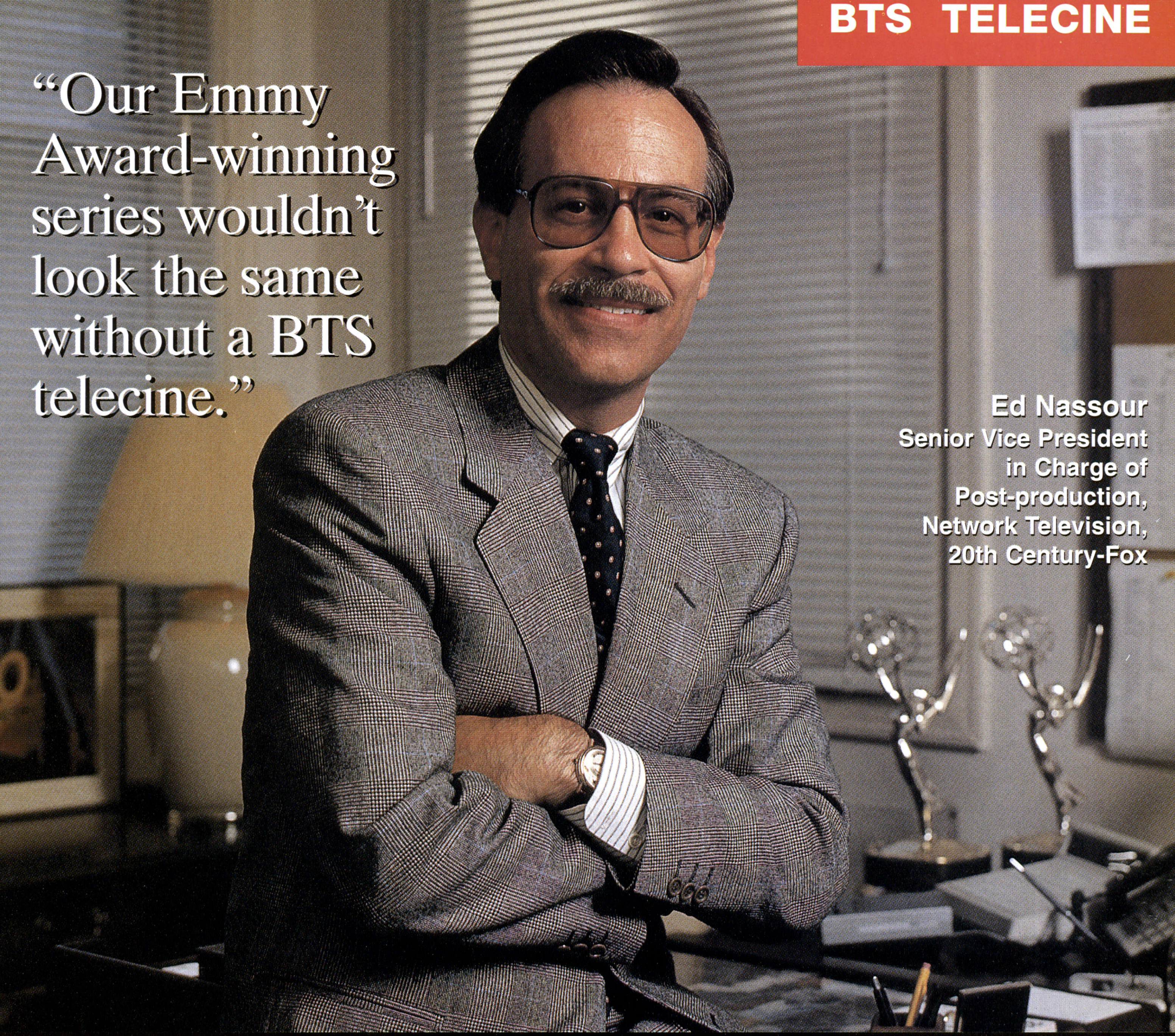
Let's take a look at Oliver Stone. He is definitely one of the most respected and refined filmmakers, [and] has tackled some of the biggest tasks in terms of stories to tell. His films are technical masterpieces, [but] *Natural Born Killers* is a random stream of violence. Yes, it is beautifully photographed (as far as one can speak of "beautiful" considering the subject), but we don't get to enjoy it, because hardly any cuts lasts longer than a fraction of a second. You are being banged over the head, MTV-style. Why does he let himself sink down to that level?

I would like to assume that with *Natural Born Killers* Stone is trying to show and critique the craze and density of violence in temporary America. The effect he achieves is in my mind completely opposite. Violence is glorified and "eroticized." The kids (specifically the endangered ones, the ones in gangs and with access to the guns) who should watch and learn from these movies do not get the point. Instead, they say, "Hey, this is cool, great guns, killing is real easy. Wow." Next, they go out and play *Natural Born Killers*, which has happened in France. So, in terms of message — to agree with Bailey — his film is a complete and utter failure, as much as countless other films where lives do not count anymore. Killing becomes effortless and legitimate, as in Tarantino's latest claim to fame, *Pulp Fiction*. You leave the theater all banged up and annoyed, asking yourself, "Why? Why do I need to watch this?"

Yes, we do live and work in a violent society, and it is natural and actually important that films reflect and explore this violence. But please don't forget the message while you are having fun shooting all these scenes of gore and bloodbaths. Don't forget why this movie is made in the first place. Don't forget who your audience is. Don't forget it's not violence for the sake of violence! Showing off by going to our cinematic and technical limitations, which seem to fade away more and more on a daily basis, you are forgetting that violence is not heroic. It is OK to explore the subject of violence tastefully and in the right dosage, so that it's not exploitative. In *Menace II Society*, the violence is just as real, but it's not glorified. It is so real and scary that even people with the lowest IQ (the ones who are in that marginal danger group of society) will get it. Other examples are *Boyz in the Hood* or *Juice*.

At this point I am really fed up. I have to think back to film school, where we saw, at each student film screening, what happens if you let a bunch of kids who grew up with too much television let go with a camera. Our teacher would almost always end up saying, in his charming Polish accent, "Guys, can't you think of something nice?"

— Mark Popp
North Hollywood, CA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"We did split screen tests between a traditional transfer system and the BTS telecine, and found the BTS to be sharper and with more depth.

"If you start with a diffused look, it looks degraded by the time the signal gets over the air to your home receiver. Using a BTS telecine at the start is the only acceptable way to preserve the image.

"If we had transferred it in the traditional way, it would have been grainy and lacking sharpness. This would have been evident to everyone.

"It's that level of trust that also put 'Chicago Hope' on a BTS telecine.

"And I'd be proud to put other 20th projects into facilities that have BTS telecines."

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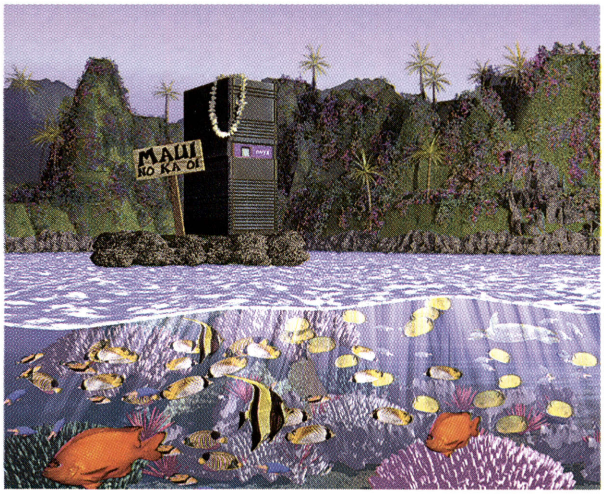
"Picket Fences" and "Chicago Hope" are transferred at Anderson Video, a full-service video post-production facility in Universal City, California. "Picket Fences" and "Chicago Hope" are produced by 20th Television.

Production Slate

compiled by Marji Rhea

Computing Center in Paradise

The Maui Film Office is heralding its host of film production and digital effects companies and the Maui High Performance Computing Center (MHPCC), which in combination have the potential to establish the island as a nexus point for all applications of CGI for special effects and animation in film, television and the emerging interactive technology industries.



Companies based in the 330-acre Maui Research and Technology Park in Kihei include Synchromic Studios and their $1.2 million imaging and film/video production facility; Big Kahuna Productions, specializing in CD-ROM authoring, film production and 3-D modeling; Digital Resource Corporation, providing multimedia and CD-ROM production; and Chameleon Multimedia, currently developing a digital sound stage and camera.

Digital effects artists such as Nick Ilyin — formerly senior animator for Pacific Data Images (PDI) and presently special effects supervisor for Synchromic Studios — have joined a host of award-winning filmmakers including Richard Mann, Lou DiLiberto, Jay April, Warren Miller, and Barry Rivers, all of whom live and work on the island. Classically trained artist-turned-animator Gil Bruvel has caught the attention of effects industry leaders such as ILM's Ken Ralston, who was recently on the island as a presenter for the annual "Art-Tech Maui" Festival.

Most companies are linked via fiberoptic connection to the MHPCC, a $21 million facility that is home to IBM's latest supercomputer, the PowerParallel SP2. Capable of performing 100 billion floating point operations per second, its 400 nodes of power will enhance the current rendering capabilities that exist with the production companies online now.

The Center is ranked as one of the ten most powerful supercomputing centers in the world in terms of computing power. A Silicon Graphics Computer Systems Onyx RealityEngine with four processors provides another 2.4 billion scientific calculations per second. Connectivity to the Park's companies and to the Center is equally advanced via fiberoptic network. Linked through the world's largest transoceanic fiberoptic cable, the MHPCC is the information superhighway's western-most terminus, allowing greater resolution on all Internet activity generated from the park.

The Maui Research and Technology Center also provides a video teleconferencing facility, which enables producers to view dailies or other data transmitted to them while on the island. The MRTC features a digital lab, multimedia training, a LAN with multiple servers and a WAN with high bandwidth Internet connections. SGI Indy graphics workstations and Newton Message Pads are also available to rent.

Synchromic Studios recently announced the addition of an Avid online suite, an SGI Onyx with four CPUs, 256 MB of RAM, Sirius Video, an Indigo 2 Extreme with 96 MB of RAM, Indy workstations, a Mac Quadra with Radius and a full complement of software, from Adobe to Renderman and Wavefront.

For information: Georja Skinner, Maui Film Office, (808) 243-7710, FAX (808) 243-7995, Internet home page http://www.maui.com/~county.

Arri Films

Arriflex Corporation is announcing that it is producing three films, plus a companion book, about the new 16SR3 camera system. They are being shot worldwide by director of photography Jon Fauer (who also wrote the Arri 16SR Book and created the companion film "16SR Close-up"). "16SR3 in Six Minutes" is an introduction to the camera, and should be most useful to producers, directors, networks and studios, as well as directors of photography. "16SR3 — Nuts and Bolts" is a half-hour or longer instructional how-to, geared to the camera assistant, to help familiarize anyone with the use and maintenance of the camera. "Timecode and Postproduction" deals with advanced electronic features, timecode, editing, telecine, and lab procedures of the new generation of cameras.

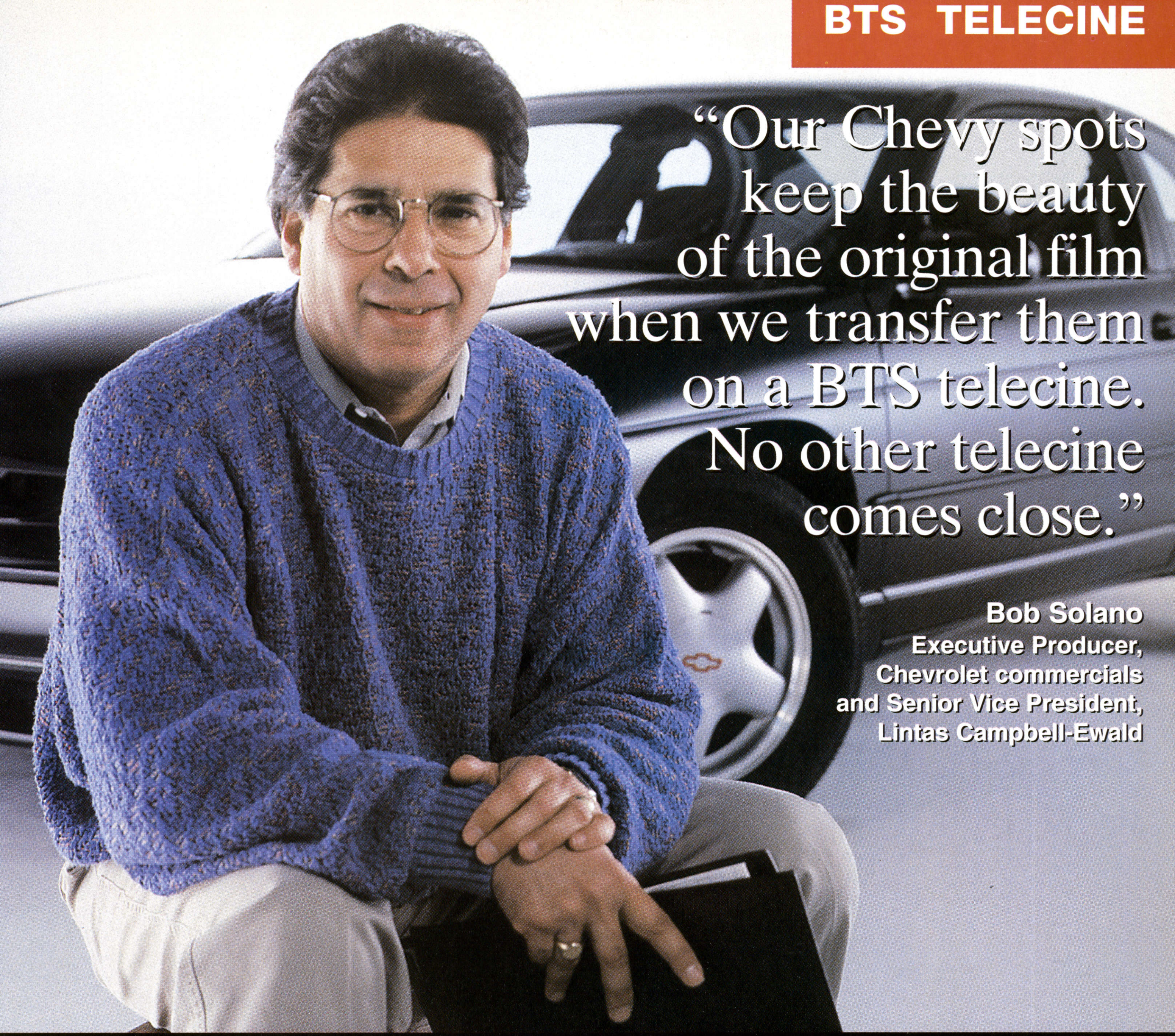
Anyone interested in being on the front side of the camera for a change — or anyone involved in an interesting 16SR3 shoot — is invited to contact Franz Wieser, assistant vice president of marketing at Arri. The films will be distributed by Arri dealers worldwide on videocassette, and will be available by summer.

For information: Arriflex Corporation, 617 Route 303, Blauvelt, NY 10913-1123, (914) 353-1400, FAX (914) 425-1250.

Post Online Service

The International Teleproduction Society has introduced ITSNet, the only online service dedicated to the teleproduction industry. ITSNet will con-

BTS TELECINE



“Our Chevy spots keep the beauty of the original film when we transfer them on a BTS telecine. No other telecine comes close.”

Bob Solano
Executive Producer,
Chevrolet commercials
and Senior Vice President,
Lintas Campbell-Ewald

“Over the last 12 years, I’ve probably transferred 90% of all the footage I’ve ever shot for Chevrolet. So when I transferred several scenes on the BTS telecine at GTN and saw what it could do, I knew I was looking at something special.

“It was precisely the look I wanted. It brought out all the detail in shadowed areas as well as full sunlight. It was a clean, sharp transfer. Everyone was so pleased with the transfer that we finished the commercial on the BTS system. I found I could do things I couldn’t do on another telecine.

“That was two years ago and I’m still transferring with BTS and GTN.

“We take great care in filming our client’s products. We need them to look as rich and sharp as they did the day we shot them. If a telecine can deliver that kind of film quality onto videotape, that’s the one you choose.

“That’s why I choose BTS for my Chevrolet transfers. It’s that good and that simple”

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Lintas Campbell-Ewald transfers Chevrolet film at GTN, a full-service teleproduction and post-production facility in Oak Park (Detroit), Michigan.

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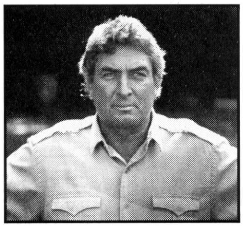

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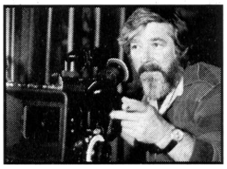

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nect subscribers to a network of electronically stored and edited data related to production and postproduction, utilizing vendor areas, user groups and public forums. At this time, the service is only available to ITS members, though others are invited to advertise on the system.

Subscribers will be able to access information related to ITS programs and services, industry news and activities, credit information, clients, colleagues and competitors, and equipment manufacturers and other vendors.

Developed in response to the needs of the postproduction facilities which make up the ITS membership, ITSNet has the potential to save considerable time and paperwork for facility owners, engineers, editors and others who are interested in keeping abreast of technology, new services, or current business issues. With the system, ITS member facilities and manufacturers will be able to more easily and efficiently exchange and access the most up-to-the-minute information on these topics.

While any subscriber has access to all the information on the network, each facility can customize its access within its own operation via passwords. Specific individuals — the CEO, CFO, or engineering staff — can make use of selected data relevant to a specific department or issue.

Members can connect to ITSNet with either a Mac or Windows system from virtually anywhere, allowing even laptop access for travelers. The basic requirement is a computer with at least four MB of RAM, VGA or higher screen resolution, plus a modem, preferably with 14.4 baud for handling large file transfers and graphics.

For information: ITS (212) 629-3266, (213) 654-7890.

Multimedia Network System

Editel/Chicago has been beta testing CreativePartner, a software system which will allow Editel to send video, audio and text over ISDN lines to any client's computer system. The system will permit clients to view this material on their computers, make revisions and additions directly to the file, and send it back. With the addition of this service, Editel/Chicago has become the only postproduction facility in the midwest with a completely integrated multimedia network system in which to communicate with clients as well as internally. Each edit suite and all of the producers' offices have Macintoshes, so it is possible to have groups of people collaborating within the building as well as with the remote client site.

The system can be utilized directly from an agency producer's desktop as easily as he or she would use e-mail. Editel will be working closely with Ameritech to help clients get hooked up to ISDN lines and streamline the networking process. In addition to communicating with agencies and clients, Editel will be able to network with creative team members who work on projects within the facility. Duck Soup, Calabash and several ad agencies and creative teams who work with Editel are scheduled to be online with CreativePartner soon. Internally, the system will be used for editors and designers to collaborate on projects simultaneously, which will facilitate better communication on a job-by-job basis.

Currently, CreativePartner can run on Mac QuickTime and will soon be supported by Windows. Other users of CreativePartner include Disney, Viacom, Colossal Pictures, Young and Rubicam, Foote, Cone & Belding, and Grey Advertising.

For information: Editel/Chicago, (312) 440-2360.

Multimedia Design Facility

Crawford Communications has opened a new multimedia design and production facility in Atlanta. The new 17,000-square-foot complex is adjacent to Crawford's postproduction, animation and satellite facilities on a five-acre site two miles north of the city.

Crawford's multimedia division was established over ten years ago and now employs approximately forty designers, programmers, enigneers, producers and support staff. The multimedia group has developed a variety of nationally recognized interactive projects since its inception.

For information: Crawford Multimedia, 535 Plasamour Drive, Atlanta, GA 30324, (404) 365-2266.

Florida State University Expands

After four years of planning, design, and construction, Florida State University's Film School has opened its new film education facility. The state-of-

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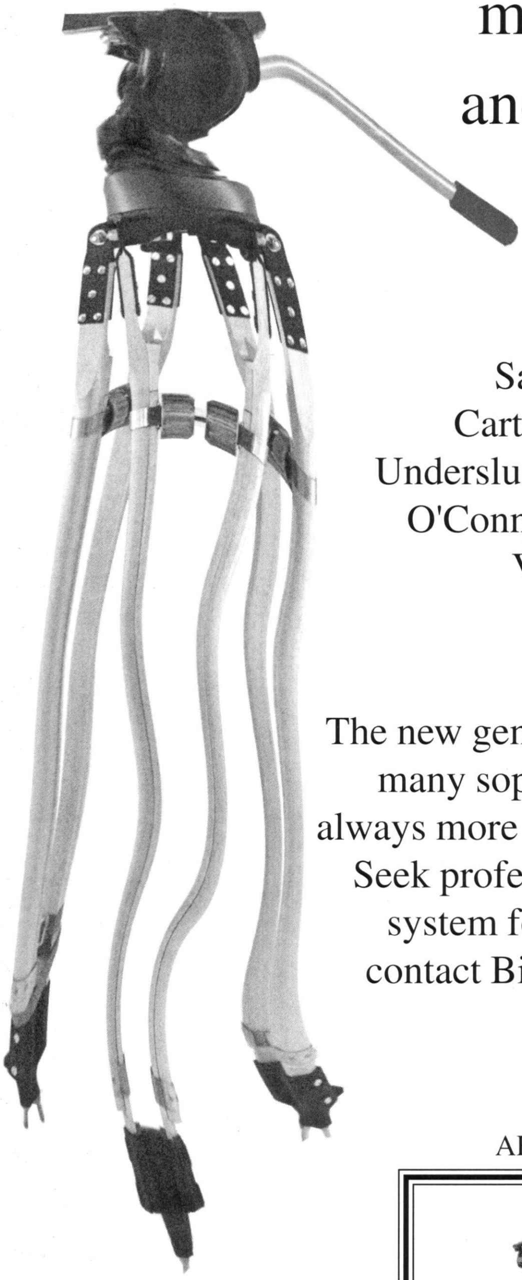

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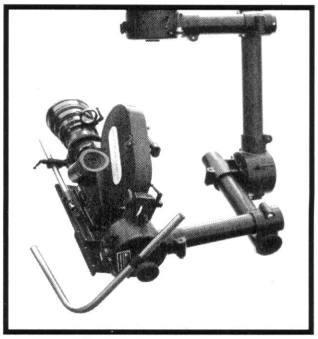

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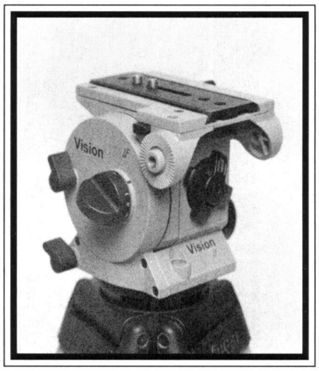

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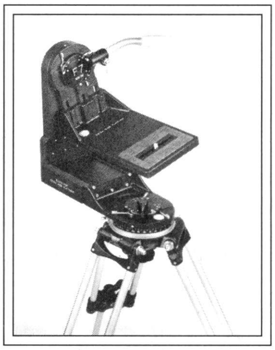

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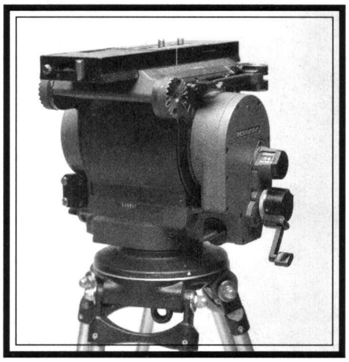

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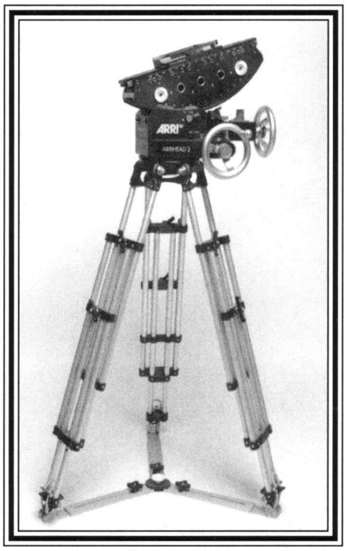

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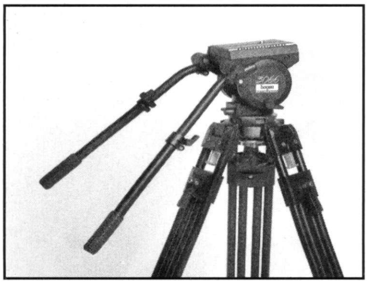

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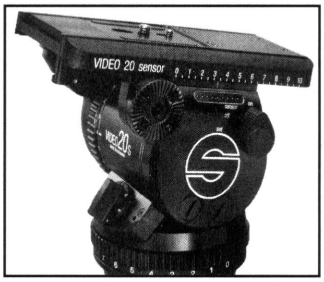

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the-art film production facility is the first unit to be occupied in the University Center Building campus in Tallahassee. The first students to use the facilities are the undergraduate classes of 1995, 1996, 1997 and 1998, while graduate students from the Film School's Film Conservatory in Sarasota will also begin using the new studios in the fall of 1995.

All of the new sound recording and editing facilities installed in the Tallahassee studios are digital in nature. This includes acoustic voice and music recording, computer-generated synthetic sound, ADR "looping," Foley recording and multi-track audio mixing.

The new facilities in Tallahassee include two acoustically isolated sound stages, one of 2,500 square feet for thesis and workshop productions, and the second a teaching stage of 1,500 square feet. Both are equipped with catwalks, while the larger stage will also be fitted with a computer-controlled lighting rig consisting of six movable lighting pods that can be lowered from the 35-foot-high grid to within four feet of the stage floor. Each pod will hold 1,500 pounds of lights, powered by a distribution system capable of delivering more than 100,000 watts of electrical power to the large stage and 60,000 watts to the smaller.

An entire floor is devoted to postproduction facilities, including two audio mixing rooms, nine conventional editing rooms and three Avid nonlinear editing suites. A 155-seat screening and audio mixing theater, extending through the first and second floors, is equipped for both 16mm and 35mm projection, as well as high-intensity video projection.

For information: School of Motion Picture, Television and Recording Arts, Florida State University, Tallahassee, FL (904) 644-8747.

Interactive Division

Digital Post & Graphics has created a new Interactive Division to focus its experience in computer-based animation and special effects on CD-ROM and other multimedia platforms.

"We've been doing computer-based animaton and special effects for commercial and corporate video since we acquired the Seattle area's first Quantel Paintbox in 1983," says DPG vice president and general manager Terri Williams. "Application of our computer graphics capability to CD-ROM and other

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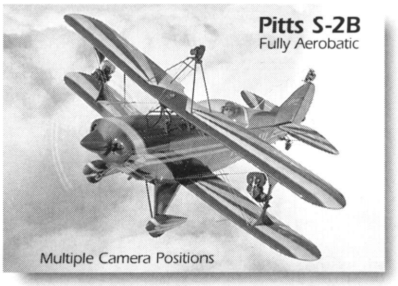

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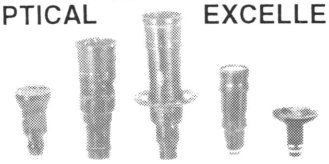

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interactive or multimedia platforms is a natural extension for us."

DPG recently completed the character animation for "Scholastic's The Magic Bus Explores the Solar System," a CD-ROM produced by Microsoft Corporation.

For information: Digital Post & Graphics, (206) 623-3444.

New Euphonix Offices

Euphonix, a manufacturer of digitally controlled analog studio systems for the music, TV, and film postproduction, broadcast, and sound reinforcement industries, has opened new offices in both Los Angeles and New York City. Both offices have fully-equipped 48-track studios for the demonstration of the CS2000. The demo rooms are available not only for customer demonstrations but also for console training. The company also has demo rooms in their headquarters in Northern California and in their Nashville and London offices.

For information: Euphonix, 11112 Ventura Blvd., Suite 301, Studio City, CA 91604, (818) 766-1666, FAX (818) 766-3401; 2 West 45th St., Suite 605, New York, NY 10036, (212) 302-0696, FAX (212) 302-0797.

EDS Acquisition

EDS today announced that it has acquired Varitel Video, a full-service film and video production and postproduction company that specializes in applying analog and digital technology in film, videotape and computer graphics. Varitel's clients include all the major motion picture studios, television networks and advertising agencies.

For information: EDS, (214) 605-6786.

Philly Digital Editing Suite

Videosmith, the Philadelphia postproduction house, has opened its new component digital editing suite, the first in Philadelphia. Videosmith was created in 1974 as a documentary film company by Steve and Martha Smith. Two years later, Videosmith became one of the first production companies in the country to use portable video systems. Postproduction was added in 1980.

The digital component room is built around seven key technologies: an Abekas 8100 Switcher, a pair of Abekas A57 DVEs, an Abekas Diskus digital disk recorder, an Abekas A72 character generator, a Sony 9100 Editor, a Zaxcom Digital Audio Board, and a Sony Digital Betacam.

For information: Videosmith, 520 North Columbus Blvd., Philadelphia, PA 19123-4214, (215) 238-5050, FAX (215) 238-5055.

New Digital FX Division

Available Light has expanded its Burbank-based production facilities by establishing a new computerized digital special effects division. Three new key digital effects members will head the new division: Bill Arance, Digital Production Supervisor; January Nordman, Key Digital Animator; and Bob Lyss, Digital Systems Supervisor.

For information: Available Light, 3110 W. Burbank Blvd. 91505, (818) 842-2109, FAX (818) 842-0661.

Digital Audio Posting

Varitel Video of Los Angeles recently posted the third season of the MTV reality series *The Real World*, in a project that included an innovative new approach toward audio post. Foregoing a conventional 24-channel tape mix, the facility instead did all of the audio editing and mixing in a digital audio workstation, a technique that enabled it to maintain first-generation sound quality through to the finished master.

For the first two seasons, audio post for *The Real World* was done via conventional 24-track tape mixing. But for this season, the producers chose to go a different route that would provide more flexibility and improve quality. Original production sound was loaded directly into the hard disks of Varitel Video's Fairlight MFX III digital editing system. All of the editing and mixing work was the done in the random access system with the final mix output to D-2 video.

This method had several advantages, according to audio mixer Terry Mader. "Last year, if they had up-cut or down-cut a word by mistake in video, something that often happens in documentaries, I couldn't fix it without going back to the original tape, finding the cue and synching it up," she explained. "This year, because we auto assemble right here, we take a tab at both ends of each edit, so if we want a little more, it's already there."

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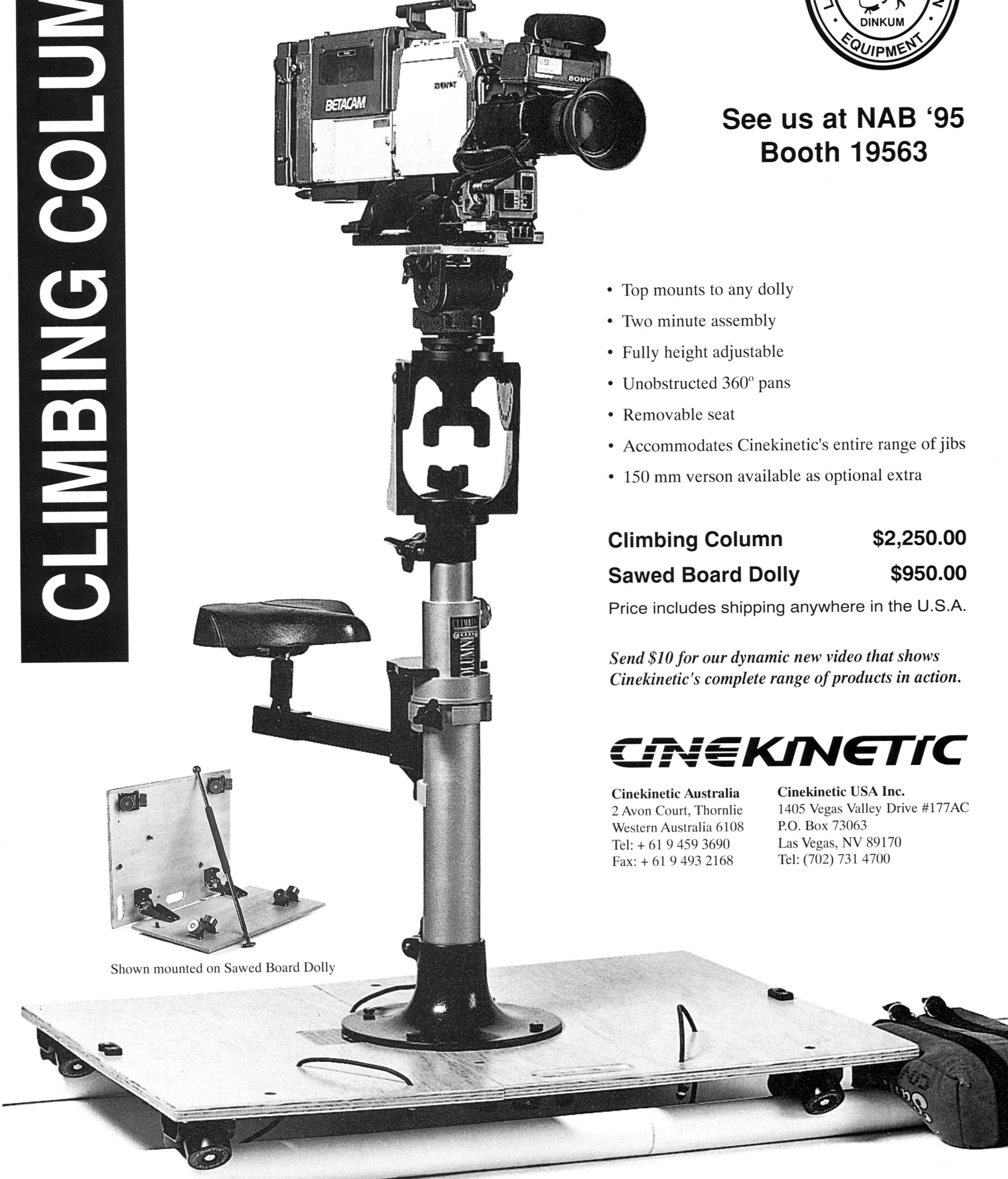

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GUNNER LIGHTING & CAMERA

Varitel Video also provided telecine transfer and online editing services for the show.

For information: Varitel Video, 3575 Cahuenga Blvd. West, Los Angeles, CA 90068, (213) 850-1165.

Video Clip Service

Logica, a European independent consultancy, systems integration and software company, and Abekas have combined forces to develop Clipstore, a new technology which provides rapid and accurate access to video clips. Clipstore manages video clip resources effectively to make the video server a practical and productive tool. A complete package of facilities includes substantial online capacity which is accessed through integrated frame-accurate editing and presentation graphics and effects. Clipstore offers recording and random-access replay in uncompressed CCIR 601 quality video and audio, for both clips and stills. Its open architecture allows users to scale the system to their own needs. Single-user and multi-user environments are possible, as is live playback from single or multiple channels.

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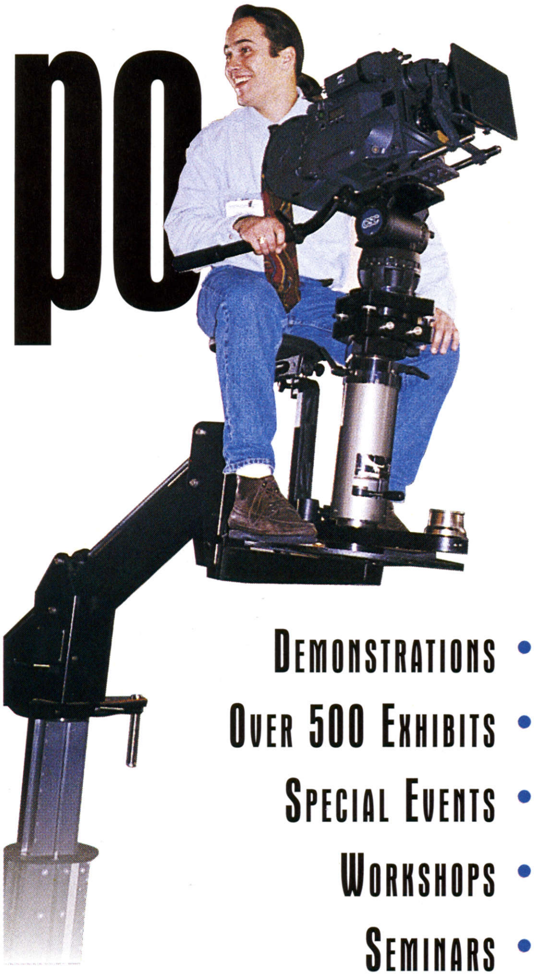

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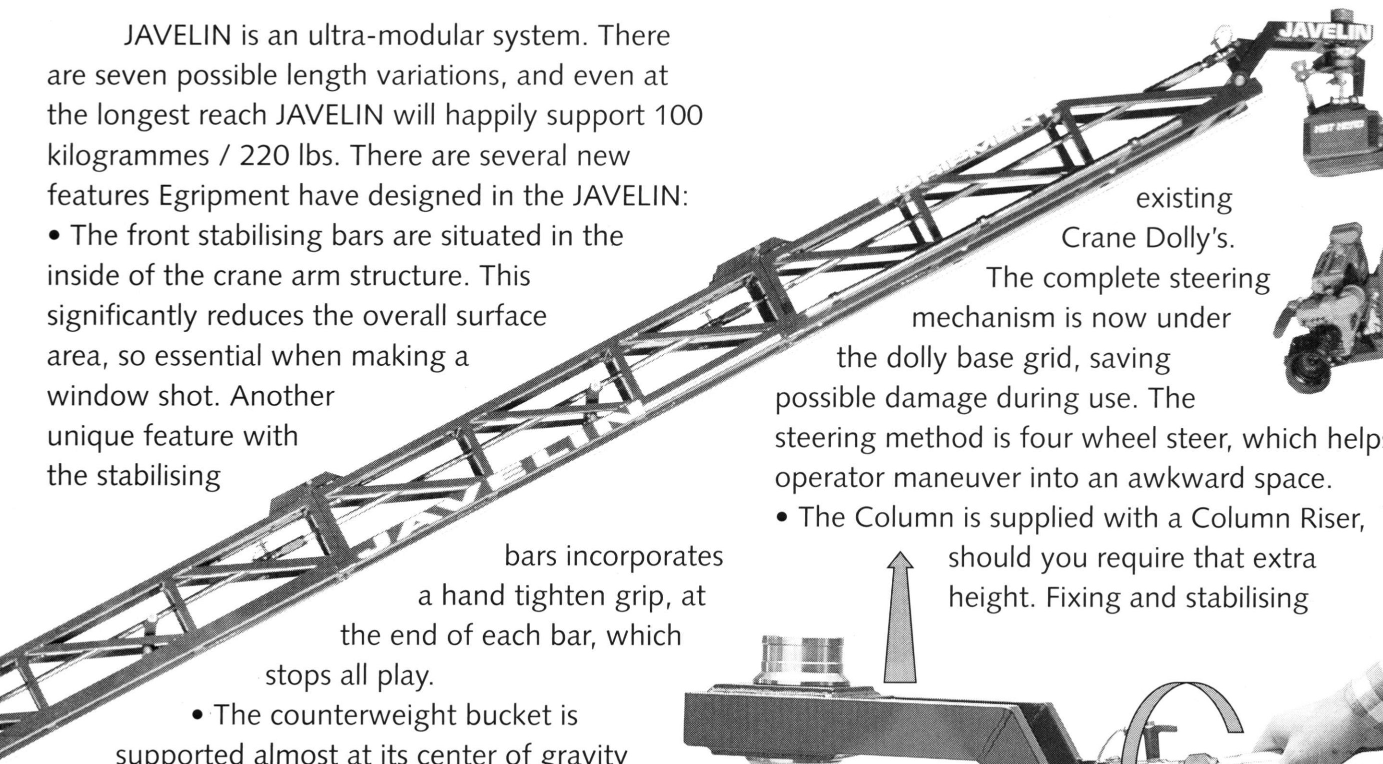

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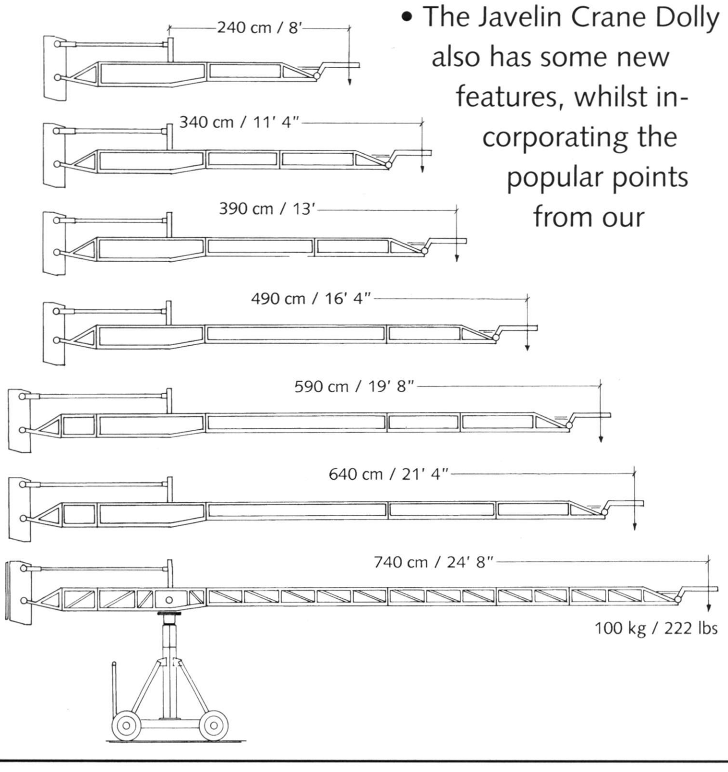

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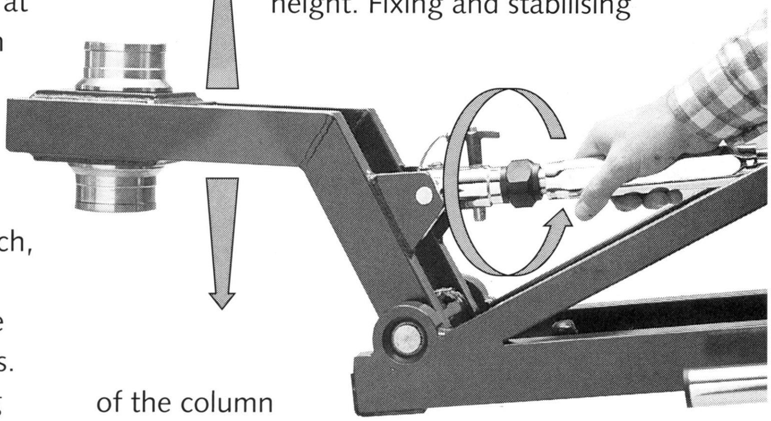

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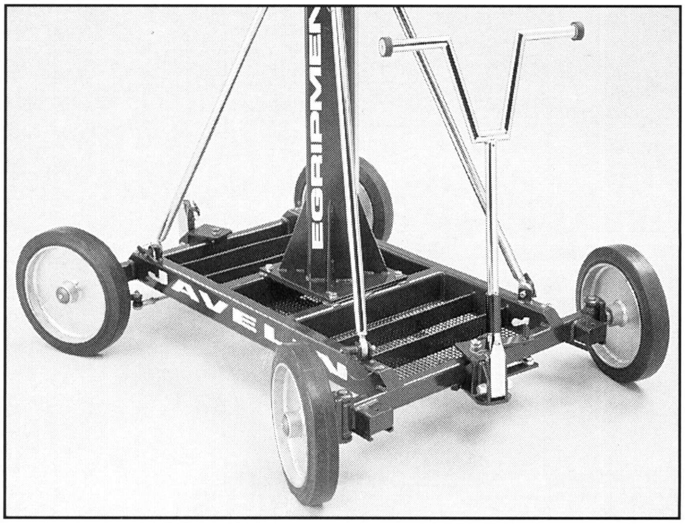

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Photos courtesy of TTO Limited.

Lending the Lottery an Epic Aura

Filmmakers concoct a painterly portrait of modern England with the help of digital technology.

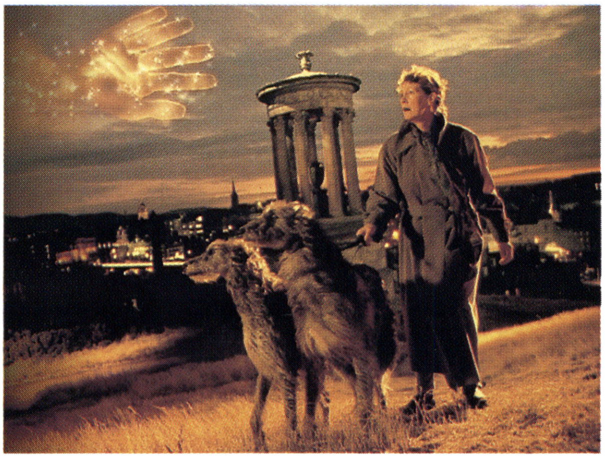
by Chris Pizzello

The lottery has never exactly been a concept that inspires strong visual imagery. The pictures that immediately form in the mind are those of perky hostesses grasping at numbered ping pong balls in sparse television studios, or harsh flash photos of beaming winners thrusting their winning cards into a wide-angle lens for the local newspaper.

When Great Britain decided last year to go forward with the first national lottery in the country's history, however, it was decided that such a landmark occurrence needed to be promoted in suitably grand style. With the British government providing a fat budget and a relatively long three-week shooting schedule, a pull-out-all-the-stops BBC television commercial was deemed the most effective way to usher in England's Age of the Lottery.

Rather than resort to the cheesy hucksterism of most lottery marketing campaigns, director Kevin Molony and cinematographer Curtis Clark, ASC, bandied about words such as "mystical," "magical" and "ethereal" in initial creative meetings. Though the commercial's running time would be no longer than the standard 60 seconds, its scope was nothing short of epic.

Starting with a (big) bang, the spot opens in space with a blinding explosion that signifies the creation of the cosmos. An amorphous entity appears out of the collision and begins to descend over Great Brit-



Opposite: *The glowing hand of good fortune descends upon a soon-to-be-wealthy family.* **This page:** *In a composition inspired by the style of director Michael Powell, the glowing entity passes over the Edinburgh countryside. The filmmakers did three separate passes to simulate the light of the passing entity (note the glow on the monument in the second frame).*

ain. Soaring over a number of early-evening rural scenes before moving into a nighttime urban setting in Edinburgh, the entity eventually makes its way to the window of a Victorian apartment complex, where a family within is watching television. The entity begins to metamorphose into the shape of a glowing hand, which points to the father — has he been chosen to be the first winner of the lottery?

In addition to a long schedule, the production had the advantage of the most advanced digital compositing tools available, including Quantel's Harry and Henry and the newer Flame by Silicon Graphics. Flame, which can composite images instantly, also allows users to bend, distort and manipulate isolated objects within a given frame. It also offers a "stabilization" feature for problematic situations in which an object from one shot will move or "weave" in the background of the shot it is being composited with.

From the outset, Molony and Clark were determined that the tools be used not for garish special effects nor as mere fix-it devices, but as a seamless means of incorporating a specific visual style inspired by the classic British films of the 1940s and '50s by Michael Powell and Emeric Pressburger.

"We wanted the piece to have a sense of wonder in addition to a sense of place," says Molony. "We searched for quintessentially British images that were more British archetypes than stereotypes, steering away from any grand, jingoistic, inflated or pompous imagery. We were trying to capture the rather magical sense that pervades the English countryside over which the hand passes. [Powell and Pressburger] films like *A Canterbury Tale, I Know Where I'm Going* and *Exit the World* all had this magical, mystical feel. They mixed a sense of wonder with a sense of place. Without sounding too pompous about it, we tried to poeticize the everyday."

While Powell and Pressburger's films inspired from a conceptual standpoint, Clark used the paintings of Joseph Wright as a more direct visual reference point for color filtration. "To recreate the overall impression of Wright's paintings, we would have to emphasize the yellow and green tonalities," he explains. "That can be very problematic in color when you're dealing with people's flesh tones, so we had to be very careful."

Clark couldn't find any color filter combinations that approximated the subtle caste of Wright's paintings, so he instead decided to test the black & white versions (#11) of the yellow, green and yellow-green filters on 5298 film, which would be used throughout the entire shoot. When those were found to be too strong, Clark had the South London Filter Company build special ¼ and ⅛ gradations of those filters. Rounding out the filter package were an 85 (sometimes with an ND), a Pola (sometimes combined with the 85), a day-for-night filter (Tiffen's new monochromatic model, which desaturates color without adding the traditional violet or cobalt effect), and tobacco filters (#s 1 or 2, depending on the situation). To ensure the proper blend, Clark shot a series of tests at Alexander Palace, one of the highest vantage points in London.

For Clark, the opportunity to exploit the new digital compositing tools in order to achieve a clean, painterly visual look was the polar opposite of the last commercial assignment he'd taken on, a spot for Energizer batteries. In that commercial (*AC* March 1994), the Quantel Henry was used to match original scenes from the classic 1933 film *King Kong* with carefully degraded new footage.

In the lottery commercial, Clark's original photography would be shot in a way that would allow the flexibility of compositing select details of a composition, shot at different times of the day, to create a seamless final image.

"I see this commercial as a sequel [to the Energizer ad] in terms of the use of technology," comments Clark. "In terms of trying to achieve a painterly perfection, the chances for a cinematographer — even with a reasonable schedule and the opportunity to plan for magic hour with the right sky and the right foreground ambience — are next to nil. You may get lucky sometimes, but you can't control the weather. So these [compositing tools] enable a cinematographer to compose an image with exactly the elements you would have chosen had there been ideal weather and shooting conditions."

Molony points out an ironic parallel between the capabilities of the newest technology and those of one of the oldest art forms. "We had the ability to select elements in-camera, just as a painter can after the composition of his painting is established," he explains. "A painter can say, 'I want this particular sky, but this particular intensity of light.' He can concoct out of nature's palette exactly what he wants to represent on canvas. We thought about it very much the same way. Once we set up the composition, we could compose and concoct different ingredients out of what was available to us at different times of the day within that chosen frame."

Complicating the location shooting in England was the knowledge that nearly every shot would contain a shimmering trail of light over the earth from an animated element (the entity) to be added later in postproduction. Here, also, the ability to shoot different passes of the same scene came in handy.

To create this light trail, Clark used several 4K HMI Par lights either in towers as high as 80 feet or on cranes, which allowed him to maneuver the sources. The lights were bounced into a Mylar reflective surface to create an undulating, "mystical" glow. "I tried to keep them out of the frame," he notes, "but if we knew a part of the frame wasn't going to be used, such as a portion of sky, then we could have the lights creeping into that section. We could actually be more flexible when we were using an industrial crane or Condor, because we could actually reposition where that lighting effect was going to be. Since we could do multiple passes, we could change the position of the effects light to fill in areas that we might not be able to get easily in one try."

In one of the most Powell-inspired images of the commercial, a woman and her two large dogs walk up a picturesque hill in the Edinburgh countryside, oblivious to the gleaming entity soaring overhead. "We composited the scene so that one pass was for her, one pass was for her and the dogs and one pass was for the sky," explains Molony. "There were also different elements of effects lights that were done without her, but still in the same frame, which actually make the light trickle down the hill and appear to run over half the town in the background. At strategic moments, we shone lights with different intensities at strategic points in the same frame without her. Then, as she walks up the hill toward us, the lights are brought up on dimmers and panned onto her from behind so that she suddenly becomes back-

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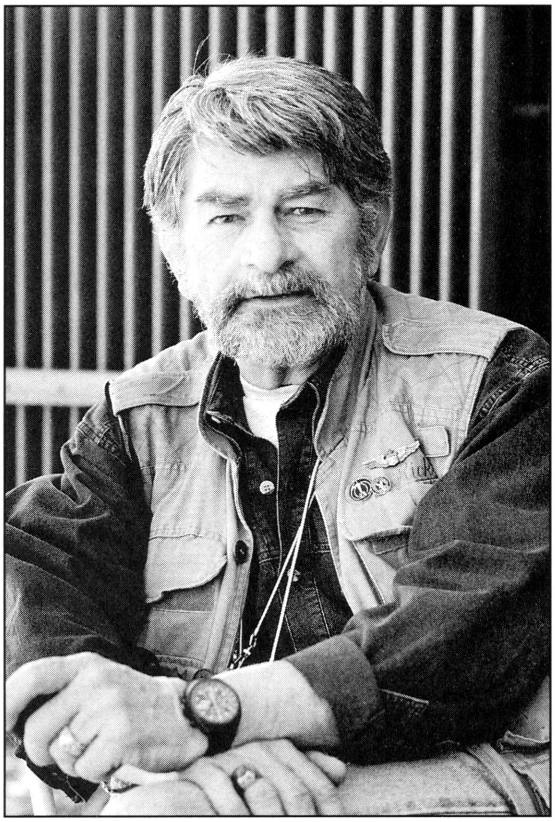
Director of Photography Ric Waite ASC talks about using anamorphic equipment from Clairmont Camera to shoot *On Deadly Ground*



Ric Waite's credits as Director of Photography include Cobra, Last Light, Marked For Death, Adventures in Babysitting, Uncommon Valor, 48 Hours and The Longriders. He has worked as D.P. on about 40 features and cable movies.

"We rented the Clairmont hard anamorphics (because they're smaller than the Arriscopes) to use with the Steadicam and for hand-holding. But they were so good I ended up using them several times on the stage, on a dolly," says Ric Waite.

"The Cooke 36 to 200 anamorphic zooms were also great – superb optics. We started out with one of those. But we soon got another from Clairmont; and we shot most of the picture with them."

"As usual, I got personal attention at Clairmont," says Mr. Waite. "Denny went out of his way to accommodate me. I have the highest respect for what he's done for all of us."

5 units, 21 cameras

During the course of the production, On Deadly Ground's five units rented eighty-four of our anamorphic lenses and twenty-one cameras. As well as Moviecam Compacts and ARRI 35-3s, they used two of our Wilcam high-speed cameras and an electronic Eyemo in a custom crash housing. Their visual effects unit also used our W7, W9 and W11 VistaVision cameras and Zeiss Hasselblad lenses.

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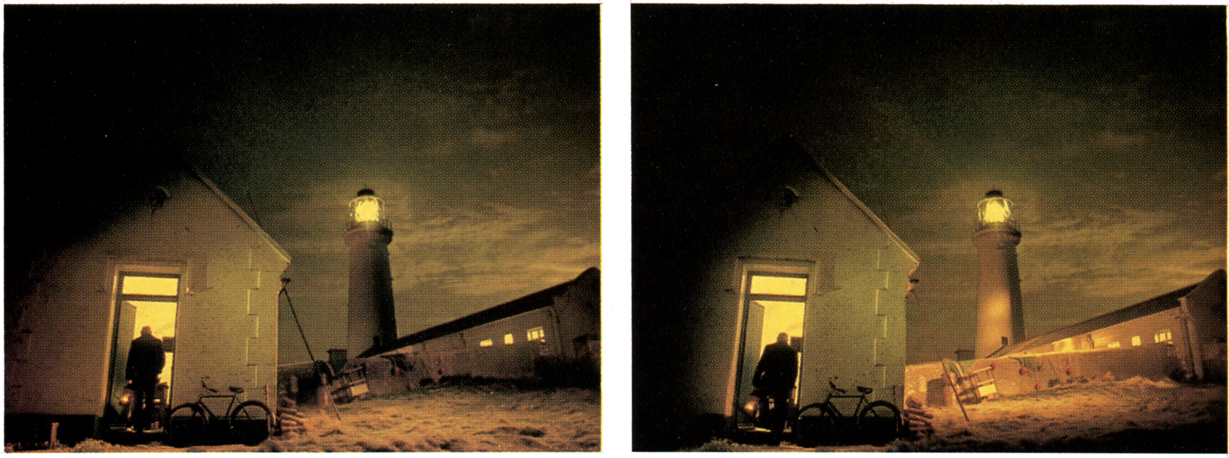

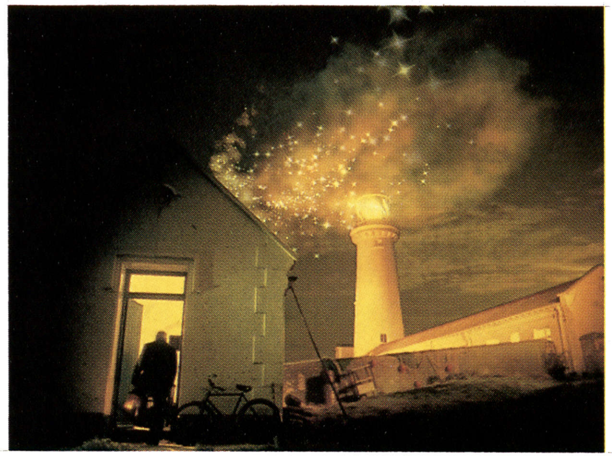

Clark and his cohorts executed several exposure passes which were composited to evoke the lighthouse scene. The sky was shot as a filtered day-for-night shot to create a moonlight effect for the sky portion; the general foreground of the lighthouse keeper with the lantern was shot at magic hour; and the interactive lighting effects were shot at night, as well as an exposure pass for the lit windows in the background building.

lit. Her dogs get spooked as they suddenly become aware of the light gaining in intensity all around them. To get the dogs to do this, we just threw a frisbee past them, at which they came up with a start!"

The filmmakers found Flame particularly well-suited to complex mixtures of ambient and tungsten light levels. The first live-action scene of the commercial consists of several competing elements: the foreground action of a lighthouse keeper entering an outbuilding with his lantern, shot during magic hour; another pass which featured the correct mixture of magic-hour ambience with both practical light from the lantern and the tungsten light spilling from a door; a separate pass of a "moonlit" sky (actually a shot of the sun behind clouds, but altered by Clark through separate exposures with the green and yellow filtration); the effect of the entity's light going over rooftops in the background; and finally, the animated element of the entity itself going through the sky, to be added in post.

For an aerial day-for-night shot from the entity's point of view during the same sequence, Molony even used Flame to insert light into places where there was none. "At the time of day we shot, the light in the lighthouse wasn't intense enough to register at all," he explains. "We had to do three or four different passes of our aerial shot of the lighthouse to try to reach a look that had an acceptably 'nighttime' feel. There had to be just enough detail for the eye to accept that the scene could be moonlit, and also so that you could look at the light on top of the lighthouse and say, 'I recognize that it's night because of those practical lights in the shot.'"

To evoke the light at the top of the lighthouse, the filmmakers used a separate nighttime exposure pass that Clark executed purely for the circling light beam itself. "With enough of a defined beam being emitted, it would then be possible to embellish that beam in post, having absolutely established what its trajectory and pattern was," Clark explains. "It would then be possible to transfer that beam and its relative intensity into the day-for-night helicopter shot. So you have the continuity of the beams' rotation merging in both shots. Flame cemented the continuity and created a seamless match, despite the radically different photographic situations — day-for-night, magic hour and night."

Through the use of Flame, Molony also mapped out an iconoclastic strategy of meshing a range of natural elements to simulate the creation of the cosmos, rather than resorting to 3-D computer graphics. "We shot four days' worth of material such as balloons of water exploding at 300 or 400 frames per second, jets of flame, and titanium being exploded into showers of sparks," recalls Molony. "It looked like bloody useless stuff, really! But by using Flame in perhaps a more subtle way, by multi-layering all of these different effects, using different texturing and rebending the images, we created a very pleasing, magical rendering of the Cosmos that has its genesis in purely, very simply shot organic materials."

The artistic ambition of the commercial, along with the historical significance of the new lottery, was such that the London newspapers reviewed the commercial as they would a feature film upon its first airing last No-

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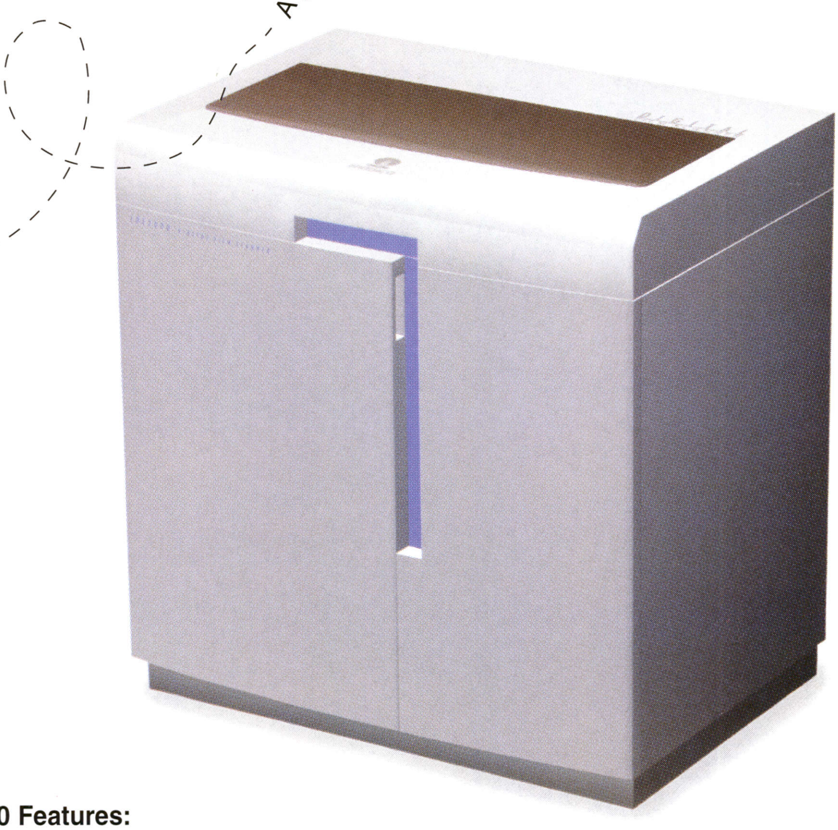

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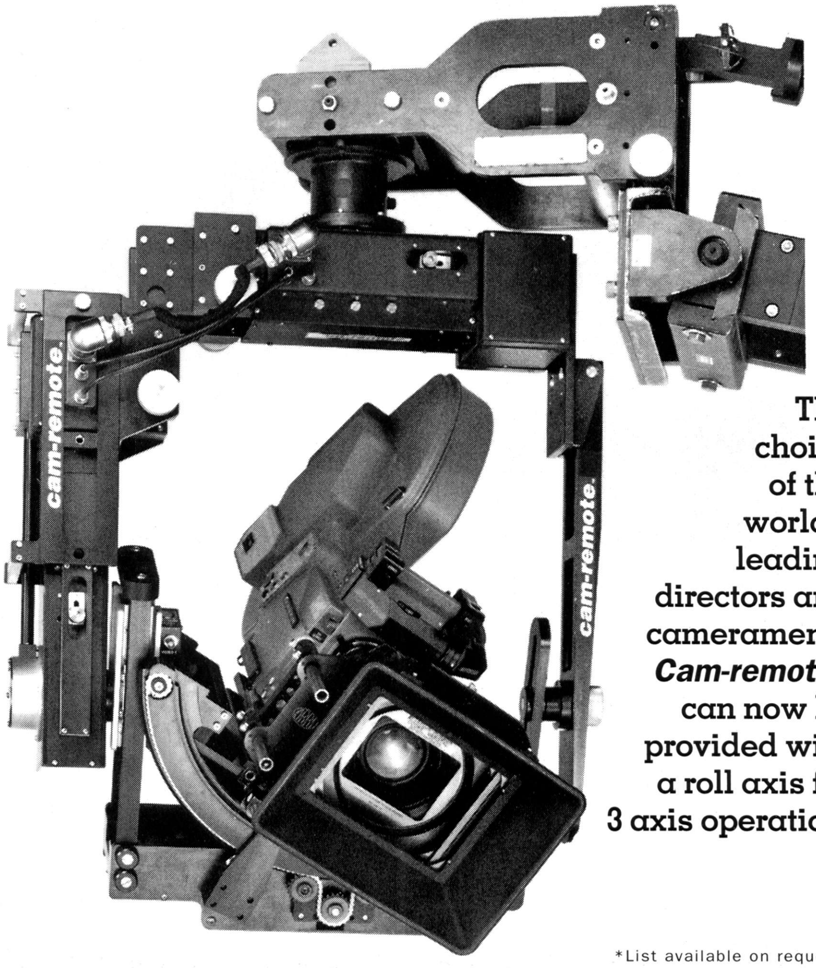

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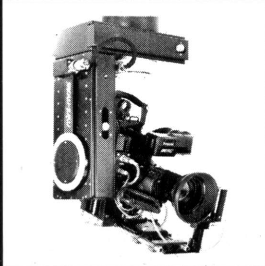

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vember. "People are starting to look at commercials as films on their own," says an enthusiastic Clark. "They're looking at what they can do as an art form, rather than just selling something. It's a hell of a challenge to compress the whole range of cinematic power into the 60-second format. But the 60-second commercial is every bit as much an art form as a 60-minute, 90-minute or 120-minute form, with its own criteria, requirements and procedures."

While the aesthetic capabilities of digital compositing are formidable, Clark points out the economic advantages of the new tools, especially in this era of constricted budgets. "Costs are constantly being questioned in terms of the scale of production, set construction and shooting schedule," he states. "[Digital compositing] adds a certain flexibility, scope and scale that otherwise would not be possible, while allowing you to not sacrifice the full possibility of what the image can do. I don't think it's something that cinematographers should look at with fear or anxiety, but with enthusiasm and excitement. It's something that's here to stay."

For Molony, the most important aspect of digital compositing, as with any filmic technique, is its apparent absence in the finished product. "What I like best about [digital compositing] is that you can actually bury the method in the end result," he says. "The piece doesn't have to stand there and signal, 'Hey, we're using effects on this!' We don't want anyone to look at the end result and be able to tell what was shot live-action in the camera and what was achieved in postproduction. What you're seeing is reality, but it's an impossible reality in the very same way that a painted picture is an impossible reality. It doesn't wear its technology on its sleeve; it just gives you an image to marvel at."

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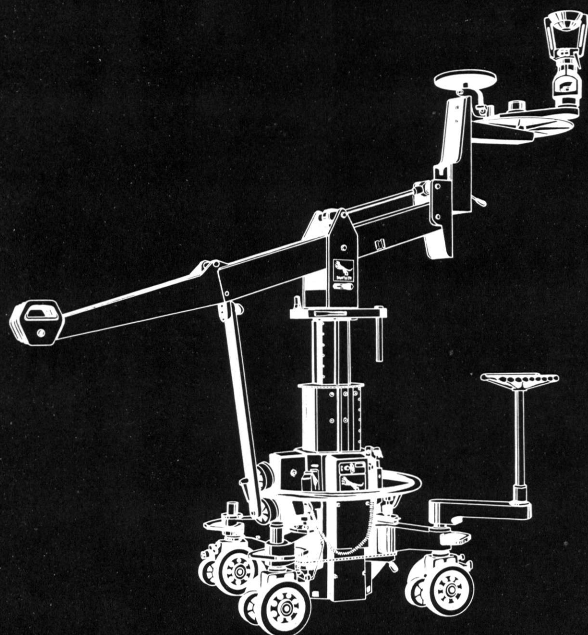

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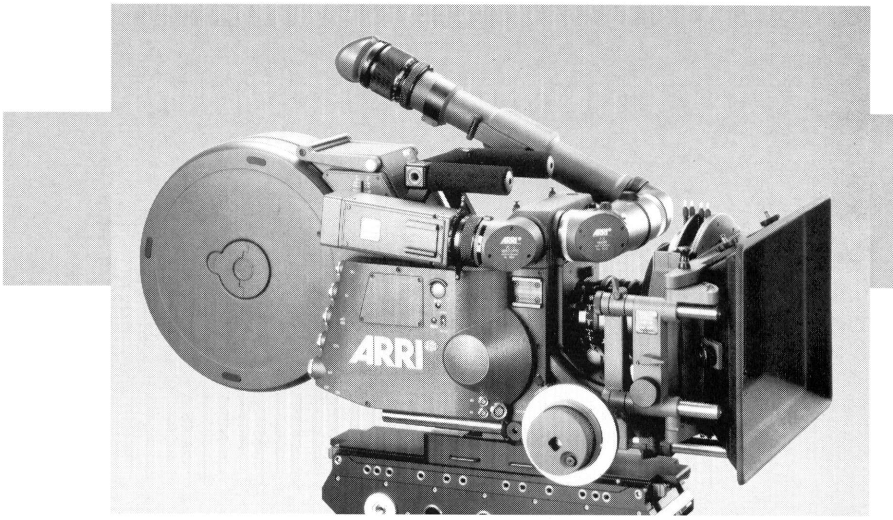

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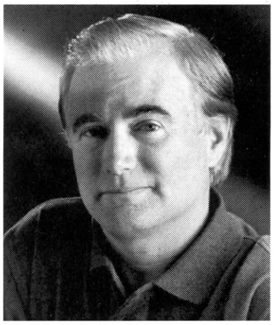

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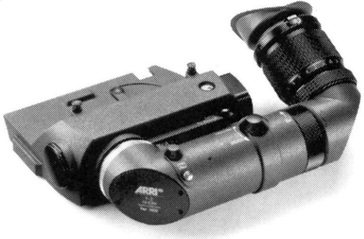

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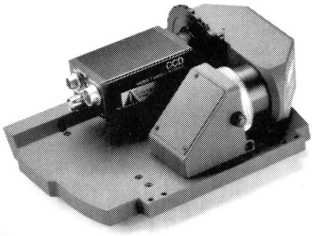

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Movies of the Future: Storytelling with Computers

Research spurs new story forms; but will audiences buy it?

by Frank Beacham

The concept is new, bold and certain to be controversial. Take a computer, infuse it with a detailed database of information about a story, and then let the computer present the story to the audience in its own way.

The storytelling computer — responding to the background, interests and preferences of its audience — decides what images or sounds to use in the presentation. It allows the story to take different points of view, choose different characters and scenes and have different pacing, and even sets the total running time.

Development of computational storyteller systems is a key research element into Movies of the Future at the Media Laboratory on the campus of the Massachusetts Institute of Technology in Cambridge. This new branch of research, led by Professor Glorianna Davenport at the Interactive Cinema Group, seeks to create a series of new cinematic storytelling forms.

Though Davenport and her half-dozen graduate students don't suggest an end of the linear narrative technique used in traditional films, they recognize that digital technology has created the possibility of new storytelling techniques that take advantage of variable, non-linear playout of image and sound.

The Movies of the Future research covers the gamut of traditional motion pictures — including feature films, documentaries and home video — yet spans to new narrative forms with unfamiliar names such as elastic media, "Thinkies," and multi-threaded interactive movies. Along with the new storytelling forms come a range of tools designed to help creators shape their stories. These tools include prototypes of advanced new software for pre-visualization, writing, editing and the creation of human interfaces.

Why, some may ask, are computers needed to help tell stories? Because, says Davenport, there is a growing need to communicate in ways that speak to the opportunities and choices that now surround us in the emerging digital age. As the old boundaries between filmmaker and audience rapidly shift, the new story forms will have far greater complexity and will permit the audience to engage in various ways to shape their cinematic experience.

Multi-threaded Movies

One promising new story form is the multi-threaded movie, where a story progresses in several ways simultaneously. Multiple "threads" are created and at times these threads intersect. As the movie gains complexity, it becomes a huge web of interaction.

Robert Altman's *Short Cuts* is a traditional film that might be compared to the multi-threaded movie. Here Altman interwove multiple stories into a single linear motion picture. However, in *Short Cuts*, the director chose when to cut from one story to another. In the multi-threaded movie, the computer, using the filmmaker's instructions, makes the cut.

But the influence of the computer goes far deeper. At any given presentation of the multi-threaded movie, the computer can determine or select the basic story structure. It can pick from literally thousands of individual image, sound and music clips to assemble its own scenes. The relationships of characters (as well as their number) may change depending on the version of the story the computer decides to tell.

The computer gets its intelligence from the filmmakers. The creative work of the writer, director, editor and cinematographer is contained in the story engine, the software that allows the computer to make its choices. The task of the filmmaking team is to dream up the story, collect its parts and create a map the computer can act upon. This is called knowledge representation.

"We are moving toward knowledge representation as the basis for a computational agent who will put the story together for you," said Davenport. "The computer knows about how different elements of the story function. It knows what a scene is and what movement of a story is."

In order to create complex multi-threaded movies, filmmakers need new tools. Kevin Brooks, a third-year doctoral student in the Interactive Cinema Group, is designing a set of writing and presentation tools called Agent Stories. The goal is a suite of software that will allow filmmakers to create and present multi-threaded movies.

Agent Stories is divided into several modules. The first, called the Structural Environment, deals only with story structure. It is pure structure without content. There are six elements:

- the speaker introduction

- the character introduction (intro of characters and setting)
- conflict
- resolution
- diversion (diverse elements from the plot driven by conflict resolution)
- ending

By adding (or deleting) and re-arranging these six elements, the writer sets possible structures for the story. These structures are used by the software to create the final presentation. "The different structures represent different genres," said Brooks. "For instance, it might make sense to start off with the speaker introduction so you know who is telling the story. And then you give an idea of the setting and present the first problem.

"However, if you were to move the speaker introduction down so it's the third element, then you'd have something more akin to a murder mystery," Brooks continued. "Or perhaps you might want to move the speaker to the bottom so you don't know who's telling the story. Another option is putting the ending at the top. *Indecent Proposal* started off like that."

In crafting a story that can be re-shuffled and told in different ways, the writer needs an environment where each story element can be precisely defined and described. The writer's environment used in Agent Stories is built on a knowledge representation tool created by another of Professor Davenport's students, Michael Murtaugh. It's called ConArtist, which is shorthand for "Concept Artist." The software has been used in various storytelling projects. Here the author is able to break a complex story into its underlying concepts and relationships. It's at this level that the filmmaker's "knowledge" is tied to individual characters and to the picture and sound elements that will communicate the story.

In Brooks' Agent Stories, ConArtist is used to tie a "clip" to a character. A clip is a single piece of information that helps define that character. Characters may have any number of clips; the more clips associated with a character, the more complex that character becomes and the more choices the computer has to choose from in telling the story. The clips have linkages. "You can link clips by saying one clip should precede or follow another clip or that one clip must be included if another clip is included," said Brooks. An important task for the storyteller is to insure that each clip in ConArtist either supports or opposes the main idea of another clip. It's here that conflict is built into the database that drives the story engine.

"When you have opposing points of view it's very clear," said Brooks. "There are two characters that, at least for this one instant in time, oppose each other. The information the writer provides in describing the scene is going to set up how the viewer understands what happens in the rest of the movie."

All of the elements of a traditional linear story are entered as the writer works with

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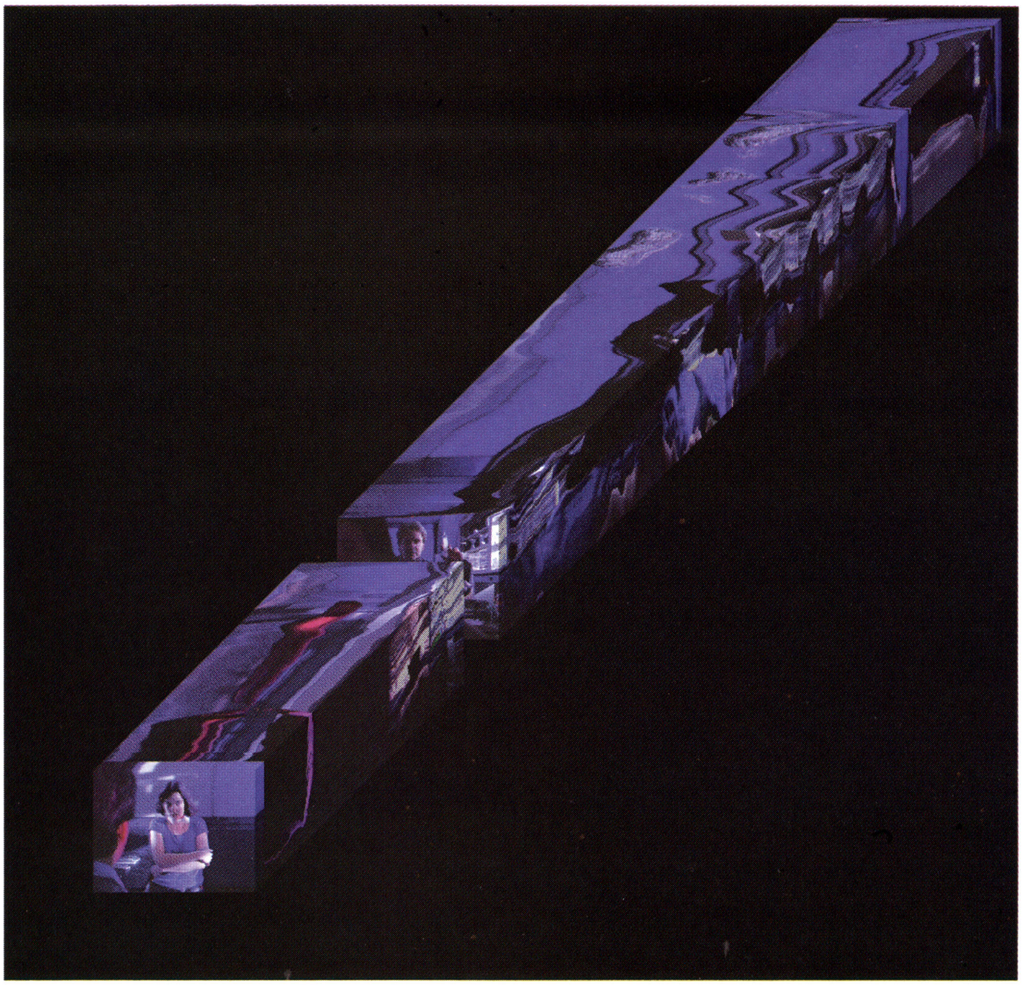

Courtesy of MIT Media Laboratory, Cambridge, MA.

Members of MIT's Media Laboratory have developed video "streamers" (a succession of video frames in a solid opaque block) which can help video editors to quickly scan and identify images on tape.

An Interview with Gloriana Davenport

AC: How were you drawn to your work on Movies of the Future?

Davenport: I'm a former artist. I used video in my art work. I got a Portapak in 1969 and then realized that anybody could be Walter Cronkite. I met (documentary filmmaker) Richard Leacock several years later when I was doing documentaries. It was the era of cinéma vérité and I was totally excited because Ricky was creating stories from life that were like the stories in the movies. I came to MIT to work for him at the Film Section and stayed until he retired in 1988. At that point I was put on the faculty here.

In 1979 the Architecture Machine Group under the direction of Nicholas Negroponte began working with videodisc players. We at the Film Section helped them work on an interactive photorealistic map of Aspen. Ricky shot some mini movies for the project: people in stores, the police chief, that sort of thing. And we helped edit these into 30-second mini-movies.

The first notion of a story engine came in 1990. I had worked before with databases, and I wanted to drive a database from a story engine. The first project was called "An Endless Conversation." It was made by Ryan Evans and Mark Halliday. It came about because one of our sponsors wanted to build a game that would teach people about insurance. So we had to have an engine to drive little bits and pieces of the story. Back then the engine was comprised of filters. The clips were Quicktime movies.

Four filters were used. One, called the template filter, insured that the story's structure was maintained. The second filter insured continuity. The third was a stylistic filter. It insured that cinematic style, in this case pacing, was maintained shot to shot. And the final filter was for interaction. It allowed the user to determine the rating — PG or R.

We've gone beyond filters because we've built systems that have more knowledge of content. But where we are moving is to a system that has actual knowledge of the characters. For example, in the case of a documentary we are doing on urban planning, we have politicians as characters and we have workers as characters. We know that politicians and workers — while they may think in opposition or they may think similarly — don't tend to get at it right away. There is a social separation that happens which reflects organizational structure and the language game. We will use software to orchestrate when to use political speak as narration and when to use it as character position, for instance.

Photo by Peter Menzel, courtesy of MIT Media Laboratory, Cambridge, MA.

Gloriana Davenport.

Is it fair to say that most of your new movie forms encourage audience members to participate in the experience?

Davenport: Yes. Participatory. A really good word. In all these kinds of movies the issue is how participatory the audience is.

What about the issue of isolation: in most of these new story forms, aren't people sitting alone in front of a computer screen?

Davenport: One of the problems with most conventional interactive experiences is they are one-on-one. You can go into an arcade with lots of video games and lots of people are running around screaming, but everybody is playing their own game. When we go to movie theaters we can sit next to somebody and really laugh. We laugh in part because the film is funny but we also laugh in part because the people sitting around us are laughing. How that's translated into today's media is through network connections. If I can talk with my friend while I'm immersed in an interactive experience and my friend is also immersed in the same experience, then we start to get a social connectivity which is very important.

Your concepts of new movies are radically different from anything done to date. Do you see traditional filmmakers using this technology or is this going to be the domain of a new generation?

Davenport: On the tool side, we've had writers come here and look at some of the software and get pretty excited. Same with directors. And we encourage film professionals to visit us and explore ways for collaboration. But, absolutely, this will be used mainly by a new generation, for lots of reasons. The younger generation grew up on video games. One of the reasons you see the careers of brilliant 30-year-olds take off is that they not only have the skill set but the sensibility of their generation. Their audience is their generation.

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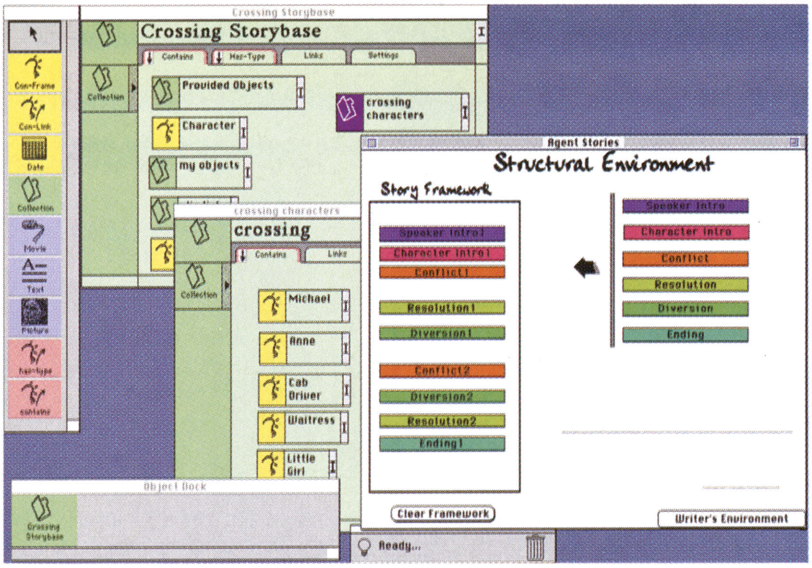
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Little Girl
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Crossing Storybase
Agent Stories
Structural Environment
Story Framework
Speaker Intro1
Character Intro1
Conflict1
Resolution1
Diversion1
Conflict2
Diversion2
Resolution2
Ending1
Speaker Intro
Character Intro
Conflict
Resolution
Diversion
Ending
Clear Framework
Writer's Environment
Ready...

Photo by David Tamés, courtesy of MIT Media Laboratory, Cambridge, MA.

Top: ***The Agent Stories structural environment.*** **Bottom:** ***Kevin Brooks, of the Interactive Cinema Group, designed Agent Stories.***

ConArtist. "The tool is attempting to capture what the writer knows," said Brooks. "The writer is slowly building a very complex web of clips. It's like the L.A. freeway system; it's a complex web of streets and interconnections and the connections are of different types."

Brooks sees Agent Stories as following the natural creative process of the way films are conceived. "The process of writing is naturally non-linear," he said. "What I want to do is make characters through linkages of various kinds. The system navigates through the database of these linkages and creates a linear story."

Once the story creation process is complete, Agent Stories moves into its presentation stage. It's here that filmmaking "styles" come into play and the software "agents" take charge.

"The software agents have styles of behavior for what they do in every situation," said Brooks. "That's how the agent chooses a clip and how it navigates through the database."

So far, in his prototype system, Brooks has created five agents. Their names are Bob, Carol, Ted, Alice and Isadora. They each have a different storytelling style and each will determine — in real time, on the fly — how the same story might be told.

"Each of the agents chooses a main point of view," said Brooks. "Bob is the kind of agent who can't decide what to put in the story except to support opinions with other opinions. Bob will try to make a very supportive story. He will pick a main point of view and then look for supporting points of view. He will then add that in the sequence and choose everything accordingly.

"Carol, on the other hand, is a one-sided story agent. She will choose a point of view and then try to invalidate opposing points of view. Her style is like that used in political commercials or propaganda. Ted is a point, counterpoint agent. He will be very fair."

Yes, Brooks admits, there is a strong temptation to create agents modeled after great film directors. Like a Hitchcock agent or a Welles agent. But, he said, "it's not there yet."

In the final stage of Agent Stories, the viewer chooses an agent to tell the story. "You come in, sit in front of the TV, and say, 'I'd like Bob to tell me a story and I'd like it to be a 12-minute story.' Bob goes through the material, assembles the movie and then shows it."

Thinkies

Another new kind of story is the "Thinkie," a form that drops the viewer into a non-linear, thought-provoking environment. The idea here, says Thinkie creator Lee Morgenroth, is to lure audiences into story experiences that force new ways of thinking. The key to making the Thinkie work is interactivity.

"Conventional linear cinema is terrific at relaying an emotional response to the audience," said Morgenroth, a masters student. "But one of the things that is really difficult to do in a linear medium is to get your viewer to actively think while experiencing the story. With interactivity I can let the viewer do some very interesting things.

"Currently cinema is separated into two main expressive elements: image and sound," he continued. "If you go back in history to when they first added the sound track to the film, the movies had a new name for a brief period. They were called Talkies. Now we've added interactivity, an entirely new medium for cinematic expression. That's why they're called Thinkies."

This page: *Masters student Lee Morgenroth, who is currently developing a Thinkie titled "Lurker."* **Opposite page:** *MIT student Tinsley Galyean explores a virtual-reality environment.*

Photo by David Tamés, courtesy of MIT Media Laboratory, Cambridge, MA.

Morgenroth is now developing a Thinkie titled "Lurker." It uses two methods of interactivity for the participants, the World Wide Web on the Internet and electronic mail. In order to experience this story each participant must take on the role of a computer hacker.

"In 'Lurker,' the participant is confronted with the question of what a hacker thinks like," said Morgenroth. "How does one operate as a hacker? By the time you finish this Thinkie, you've had a new experience and actually done some hacking as a process of experiencing the story. You could never accomplish that in a movie theater."

"Lurker," which is played over a two-day period, begins when a half-dozen participants log on via computer to the game's home page on the Internet. There they encounter a cybergang of hackers who are recruiting new members. In order to join the gang, each participant must take a proficiency test. Taking the test begins a new cycle of "Lurker."

As the new participants begin to take the test, a series of diversions begin involving the gang members, who are really characters in the story. One of the gang members turns up missing and an emergency is declared, launching a mystery to be solved. Each of the new participants is asked to temporarily forget the test and help out in unscrambling the puzzle.

The participants now become "lurkers" within the system and work with each other to navigate the world of the story. While experiencing "Lurker," each participant is thrust into the culture of computer hacking. This includes reading e-mail messages between the gang members and intercepting video of their activities over a security camera network.

"The active part comes when all the participants have lots of communication with each other and do a lot of net surfing to get information that's going to help them," said Morgenroth.

Though the participants in "Lurker" are not actually communicating with the gang members, these cyber characters become far more personalized than any character in a traditional feature film. Each has an e-mail address and, as Morgenroth puts out, each has its own "virtual net personality."

Since "Lurker" can run in an automated mode or with a game master, the participants can get some real surprises. "Most of the e-mail messages have already been scripted, but if the situation is right the game master can throw in one or two real messages and change the whole perception of what's going on," Morgenroth said.

Once a participant has finished "Lurker," he or she is then allowed to modify the story in any way and put it back in a new form on the Internet. Those modifications can range from making small changes in the

The Future of Cinematography

How does the role of the cinematographer change in the Movies of the Future?

One of the major areas is in the creation of images that will be placed in synthetic environments, says Professor Glorianna Davenport, director of the Media Lab's Interactive Cinema Group. "It's very, very powerful to create an action and then place that action in another environment," she said. "Cinematographers who have expertise in blue-screen techniques will be particularly sought after for work in interactive cinema."

Previsualization, storyboarding and continuity will take on expanded roles in the new computational media, Davenport said. "Continuity will be absolutely critical because we have to make continuity work for many different playouts. How do you make a shot work in a story that is told in many different ways?"

The traditional skills of the cinematographer, she said, will continue to be in demand. Creation of stimulating images, subtle lighting and innovative camera placement are just as critical in interactive cinema as in traditional media, she said.

"Just as with traditional filmmaking this interactive stuff has everything to do with story," said Davenport. "The challenge is to find those compelling stories which allow audience interaction while offering an emotional or intellectual connection. The trick is to put a good storyteller together with a good cinematographer and figure out a way to tell the story — which may now be many stories — in a very different way."

— FB

story all the way to adding one's self as a new video character. "Of course that would take a large amount of effort," Morgenroth said. "You'd have to really be motivated to do that. But there is space for the participant's imagination to work."

How does Morgenroth feel about others changing his story? "If I want people to see the kind of Thinkie I would make they can go to mine," he responded. "But then, if you 're-purpose' it — make it your own version — it doesn't annihilate mine. It just adds another."

Depending on the type of Thinkie, the filmmaker may or may not protect the spine of the original story from changes by audience members. "My guess is that the interaction with Thinkies will depend on both the Thinkie and the interests of the audience that is participating," said Davenport. "Some Thinkies might have a very strong spine. Others might keep diverging and making new spaces. In a Thinkie based on conflict negotiation, for the instance, the spine might get diffuse for a while and then somebody might come on the net and say, 'Let's make it stronger.'"

Photo by David Tamés, courtesy of MIT Media Laboratory, Cambridge, MA.

Virtual Reality

As a storytelling medium, virtual reality is tricky. The viewer, usually wearing a head-mounted display, is immersed in a synthetic world in which the viewer exists in the first person. "I am 'I' in the story. I am a character in the story. I am in the space and I am in control of the space," says Davenport.

One of problems with using virtual reality to tell a story,

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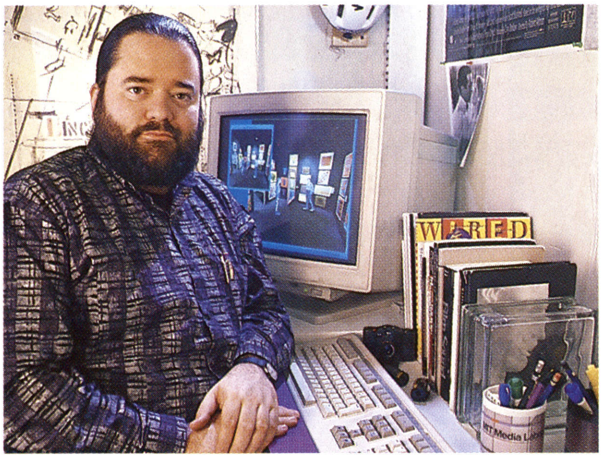


Photo by Michael Massey, courtesy of MIT Media Laboratory, Cambridge, MA.

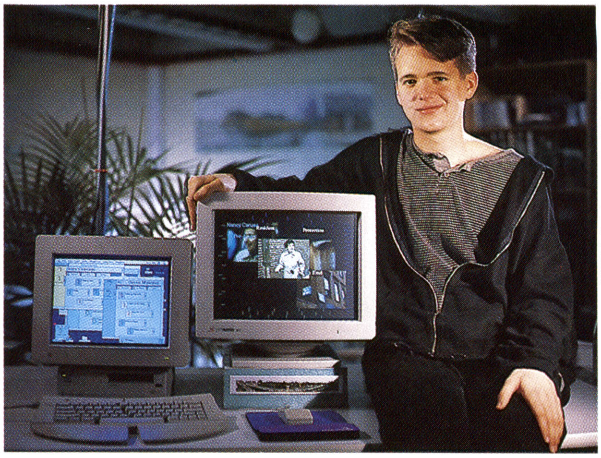
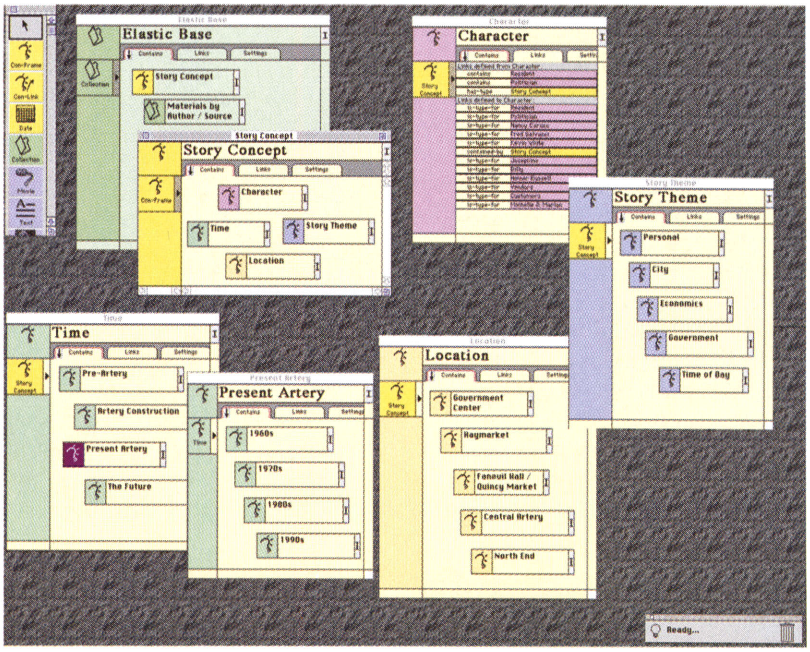


Photo by David Tamés, courtesy of MIT Media Laboratory, Cambridge, MA.

Designers David Tamés and Michael Murtaugh helped develop the complex software needed to facilitate an ongoing documentary database about the construction of Boston's Central Artery roadway.* Below: *An overview of the ConArtist software environment.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Government Center
Haymarket
Faneuil Hall / Quincy Market
Central Artery
North End
Ready...

she says, is how to modify the story on-the-fly to fit the movements of the viewer.

"In the VR world the viewer can look in any direction at any time," she said. "What happens if the viewer is looking in the wrong direction, away from where the central action of the story is occurring?"

The answer, she says, lies in "smart" characters. "The VR world is a computational world," Davenport explains. "The characters in that world can be smart; they can have behaviors. The system knows that an important beat of the story takes place in a certain location and that you are not looking at that place. So the system feeds that information back and the story — through the behavior of a character — can be modified."

To explore smart characters, MIT student Tinsley Galyean created "Dogmatic," a virtual reality story that stars a dog with an attitude. The dog, created by student Bruce Blumberg, is actually a smart character with built-in behavior patterns.

In "Dogmatic," the smart dog rides along a desert highway with his owner in a car. As the car approaches the viewer, it pulls over to allow the dog to relieve himself. Once the dog leaves the car, his actions are determined by the viewer. "The dog," said Davenport, "might pee on the cactus, or it might just walk over and pee on you." (Fortunately, the dog chose the cactus presumably because the viewer gave him rapt attention.)

Though virtual reality is part of the research for Movies of the Future, Davenport does not believe it's the ultimate goal for computational filmmaking. "I would say VR is a very small amount of where it's all going to go. I have big arguments with my students about that. But that's OK."

Synthetic Imagery

More promising as a storytelling medium — at least in the near term, says Davenport — is synthetic imagery. Unlike virtual reality, the viewing environment here is usually not immersive. There are no head-mounted displays. Viewing is done on a more traditional video display.

Synthetic imagery is comprised of synthesized, composited pictures. Characters are shot as 2-D images against a blue screen, then composited with a 3-D background. Layer upon layer of images can be transformed into multiple objects within a 3-D database.

The key component here to storytelling is interactivity. The viewer can control the angle of view in this synthetic universe. "The viewer can move within a certain domain with freedom through the set," said Davenport. "One can follow a character and change the angle of view. This really means the viewer is moving the camera."

To explore synthetic images, Davenport's students, who specialize in storytelling forms, joined students of Professor Michael Bove, who specialize in media technology, to create a video short titled "The Museum." It uses a "particle database," a type of 3-D database that can be built from 2-D images.

"The Museum" is comprised of four components: a room, an empty picture frame and two figures. The action follows a script but it is possible for the viewer to intervene and redirect the figures through the scene. In the future the viewer will be able either to change the viewpoint of the camera or — for certain stories — actually influence the character's action.

"Museum" is also contributing to the Media Lab's work in intelligently scalable (resizable) video, where the originator can specify the framing and composition of a video sequence at differing display sizes or aspect ratios. Thus a single video sequence might be successfully displayed on an LCD wristwatch, a standard TV or a large-screen projector.

As a technology for storytelling, Davenport is enthusiastic about the prospects of interactive synthetic imagery. "Creation of these types of stories, I'd bet, is going to be one of the first big successes in the area of interactive cinema. I think the film industry already understands these types of stories very well."

Elastic Media and the Evolving Documentary

A key difference between the documentary and feature film, says Davenport, is that the documentary develops as the filmmaker discovers a world — no script is required in advance. The documentary is an instantly unfolding multi-threaded story by nature.

"Life is complex," said

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Davenport. "Life is not the simple Hollywood story of a single hero and his or her tangle through life. Life is a web of people and events that intercept and combat each other and fall apart and come back together again."

Because of these elements, the documentary form was the initial guinea pig for a computational media story at MIT. The first documentary to use a computer to navigate different scenes was "City in Transition," a filmed look at the city of New Orleans during a period of intense urban change. Filming began in 1982 and the three-hour production was completed in 1987. The project, an early example of hypermedia, included a scene-by-scene database and helped define many of the issues later to be addressed in computational storytelling.

In 1989, came "The Elastic Charles: A Hypermedia Journal." This documentary about the Charles River in Massachusetts was termed "elastic media" because it contained stories which one could stretch, compress, interrupt, bend and annotate.

For a user interface, it introduced "micons," which are dynamic representations of video segments. Shorthand for "moving icon," a micon — comprised of about 60 frames of video — appears on a computer display as a miniaturized endless movie loop. (Micons pre-date Apple's Quicktime, Davenport points out.) Micons are easily programmed, using a link tool, to appear and disappear dynamically in relation to content.

More recently, the lab's work in documentaries has focused on evolving stories. As with the multi-threaded movie, viewers gain greater control over presentation and are allowed to explore and discover new aspects of the story.

To create "It Was a Knowledge War," Gilberte Houbart conducted interviews about the impact of information technology on both the military and media during the Gulf War. The database includes viewpoints of reporters from the Boston Globe newspaper and the former director of information at the Pentagon on such topics as why the war was so short, how the Pentagon filtered news for the press and what it was like to be a journalist covering the war. In watching the presentation, the viewer specifies which headline story and whose viewpoint should be emphasized and how long the playout should be.

Today, the lab's work has taken the evolving documentary form even further by creating stories that are never completed. Using the ConArtist database and a story engine, a documentary can continue to grow as journalists add new story elements over time.

An evolving documentary-in-progress at the Media Lab tells of neighborhood change in downtown Boston. Over the next few years, an elevated roadway, the Central Artery, will be rebuilt as an underground highway. The documentary database, which includes still photos, maps, sound and video from interviews with residents, politicians and planners, will grow as construction proceeds and the neighborhood changes.

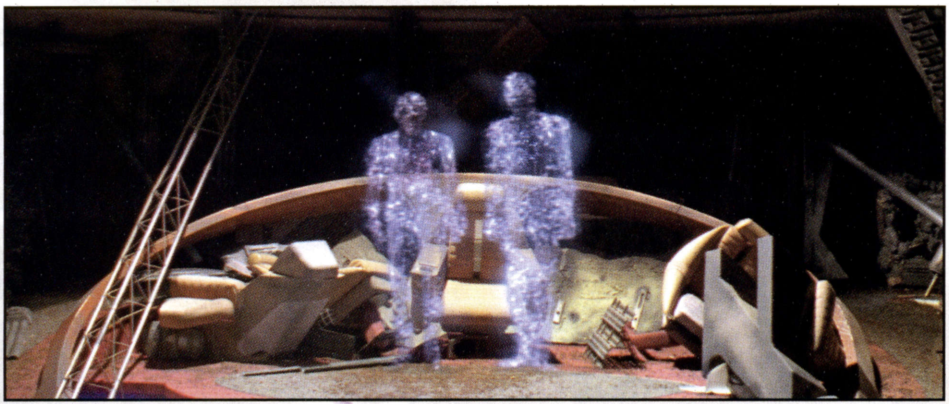
At each viewing a different story emerges, either because it is seen from a different point of view or because the database itself is altered. Principal designers for the complex software needed for the Central Artery documentary include Dave Tamés, Mike Murtaugh, Katrin Silberberg, Mike Massey and Natalia Tsarkova.

Of special interest on this project is the human interface. Moving away from point and click menus, the Central Artery documentary displays a series of images based on the story interests of the individual viewer.

"As the story plays out pertinent themes, characters, locations and times will come to the

continued on page 47

Transport Between The Worlds



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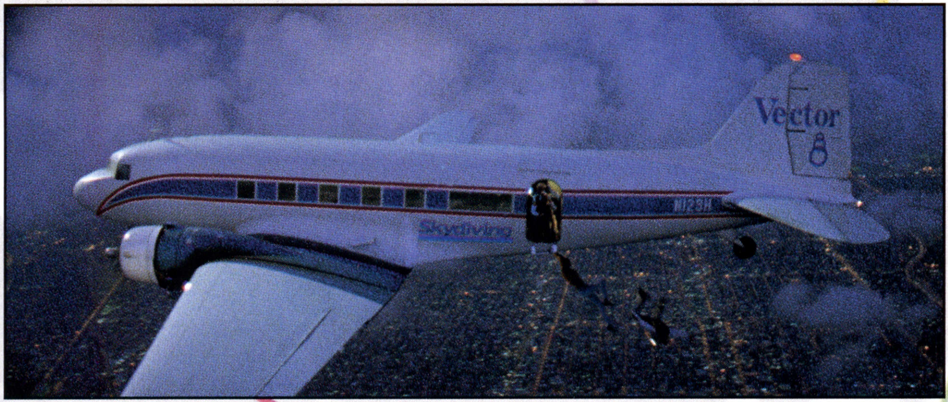

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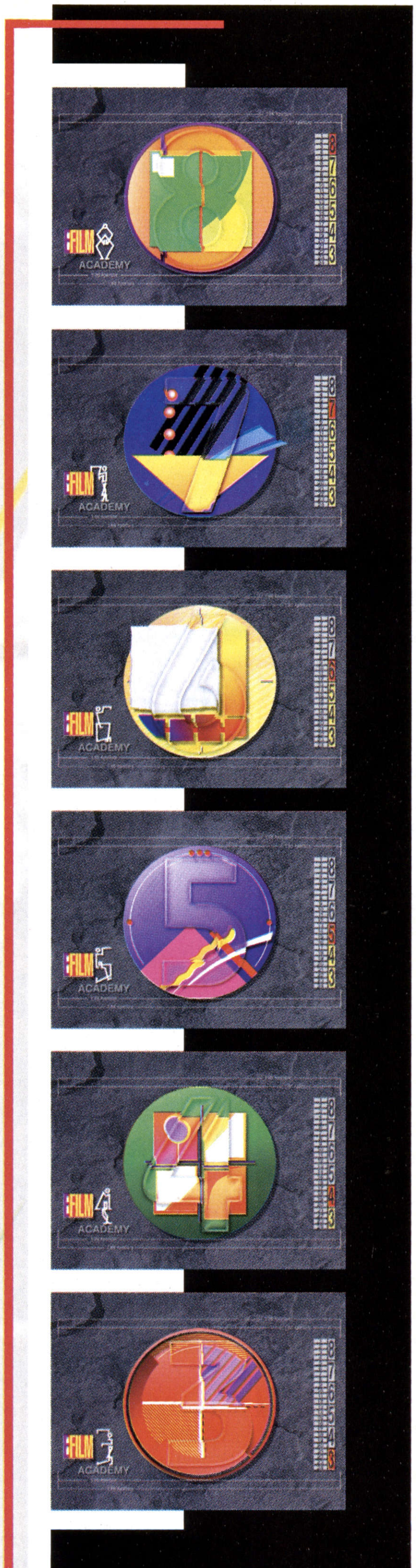

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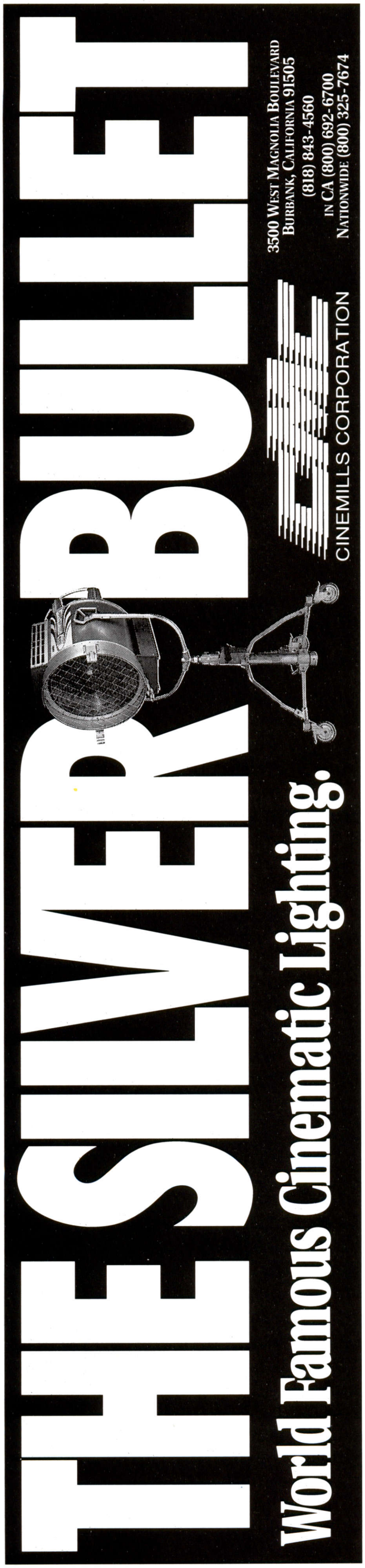

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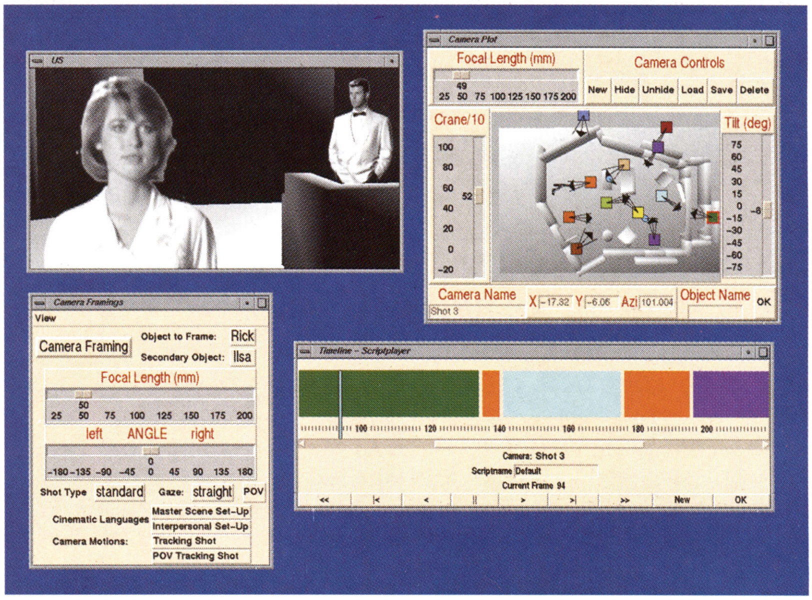

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Camera Controls
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100 80 60 40 20 0 -20
Tilt (deg)
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Object Name
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Focal Length (mm): 49

Crane/10: 52

Tilt (deg): -8

Camera Name: Shot 3

X: -17.32 Y: -6.06 Azi: 101.004

Object to Frame: Rick

Secondary Object: Ilsa

Focal Length (mm): 50

ANGLE: 0

Shot Type: standard

Gaze: straight

Cinematic Languages: Master Scene Set-Up, Interpersonal Set-Up

Camera Motions: Tracking Shot, POV Tracking Shot

Camera: Shot 3

Scriptname: Default

Current Frame 94

Courtesy of MIT Media Laboratory, Cambridge, MA.

In defining interactive story forms that will comprise the Movies of the Future, the MIT Media Lab is developing a range of new tools for filmmakers. One of those is Movie Makers Workspace, a new previsualization tool that allows cinematographers to create a set and experiment with the position of actors and cameras prior to shooting.

Developed by former MIT student Scott Higgins, the software, which runs on a Silicon Graphics workstation, allows previsualization and rapid prototyping of a scene in a 3-D environment. Blocking and camera placement/setup can be visualized using video representations of the actual actors and sets.

The software breaks new ground by applying for the first time a cinematic language to previsualization in a 3-D environment, said Professor Glorianna Davenport, director of the Interactive Cinema Group at the Media Lab. "Up until now people have used storyboards and video for animatics. In powerful 3-D environments you texture map characters and actions into a 3-D space and then move the camera to find the right spot. An important part of our research is to map cinematic language onto camera moves so the animatic or storyboard artist does not have to specify every detail of framing at a point level."

In order to allow fast real-time manipulation of the characters on the set, the actors are represented as 2-D video objects in an otherwise 3-D environment. "Rather than spend a lot of time rendering lifelike images by photographing the character every 22.5 degrees, we are able to approximate different positions," said Davenport.

The breakthroughs result in a quick and responsive system with "smart" capabilities. "Say you have two characters," said MIT student Dave Tamés. "You tell the system what kind of framing you want — master shot, close-up, whatever — and it will compute all the camera positions and create a starting point for you. You don't have to position each camera manually. Based on certain cinematic rules that the system is aware of, it will create a basic camera setup for the kind of shot you are looking for."

Beyond basic camera placement, the system can simulate tilts, pans, tracking shots and elevated crane shots. It can also simulate the view of each camera through lenses of different focal lengths. A script player creates a shot-by-shot time line.

Eventually, Movie Makers Workspace will be integrated with other tools for making interactive movies. "Ultimately, all filmmakers will need good previsualization in order to deal with the complex story scenarios of interactive cinema," said Davenport. — FB

continued from page 45

foreground and less relevant items will diminish into the background," said Murtaugh. "Basically what you see at any given moment is a collage that represents the context of the story."

Just as with Brooks' Agent Stories system for feature films, information is assigned to each piece of new material as it is added to the documentary database. The primary themes in the Central Artery story are character, time, location and story theme.

"On this project what we've had a hard time figuring out is what the interface for the user would be like if we no longer have a television screen," said Davenport. "If we no longer have a single frame and we want to create a story with multiple people, multiple characters and multiple interaction, how do we create an interface that gives the viewer some influence over the story?"

Home Movies

Lest one believe that the Media Lab's work is focused solely on the most esoteric new forms of moviemaking, Davenport insists that a top priority of her department's research agenda deals with the needs of home videomakers.

Specifically, the problem

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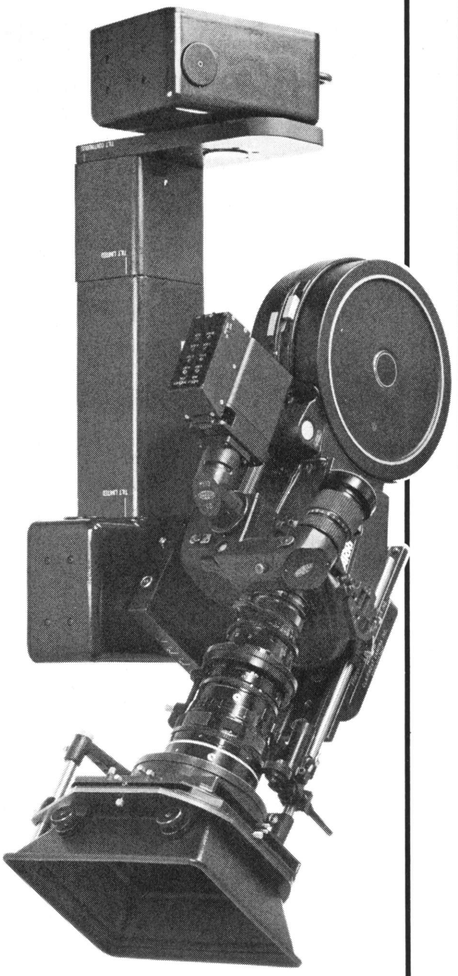

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for camcorder owners is what to do after the video is recorded, says Davenport. "Most home movie buffs don't have the time to look at all their footage and they certainly don't have the time to make the cut for Uncle Charley of the kids playing," said Davenport. "Many probably also have a rough time developing stories."

Part of the lab's focus is on how to help home videographers shape their stories. "The same issues arise for the maker of a home movie story as for the maker of a feature film," said Davenport. "Just as with the feature film, the story engine for home video software has to understand how to juxtapose characters, where the conflict is, where is the middle of the story, where is the crisis and so on."

To start, the lab has created a new way to view videotape — the video streamer. Here a succession of video frames is portrayed as a stream in a solid opaque block (see photo on p. 37). By simply pointing to a "cube" of video as it moves by, the video editor can quickly scan and identify images on tape.

The lab has also designed some prototype logging systems that draw out a story template and pull shots automatically from a database of scenes. These systems might be combined with "smart" camcorders that could identify a tape's content by location, voice of subject and type of shot (wide, medium, close-up).

"At some point you start to get these layers of information," said Davenport. "You are then pretty close to being able to have the computer make a movie about activities on Christmas morning. You might not get a very tight edit the first time you run a story model like that on your database because your data isn't well enough described. But the computer can learn as you go along. Instead of having rows and rows of tape on the shelf, you start to have a database in your computer that's intelligent enough to build stories in the future."

"We're Not There Yet"

Whenever she describes the various research projects under the Movies of the Future banner, Davenport is quick to point out that many of the software tools are only in the early stages of development and much work is still to be done.

In the feature film area, most of the stories done so far are very simple and lack the complexity needed to make a satisfying entertainment experience.

"As we develop more complexity we have to be able to represent to the (computer) system what is the motivation of the characters," she said. "The system has to understand that the character is always being driven toward the goal of finding something.

"As it gets even more complex we need to represent more, such as back story and subtext," Davenport said. "These are motivating forces for the character and we are not at a level where we can do that yet."

However, Kevin Brooks — who studies under Professor Davenport — has some doubts about how far the computer can go as a creative storyteller. Take subtext, for example. "I've thought about it a lot and it's hard to represent subtext," said Brooks.

"A computer will never be a perfect storyteller, nor will it ever do a really good job of creating proper subtext," he said. "What I'm trying to do with this tool (Agent Stories) is to develop a good relationship between the writer and the computer so there is a definite line of responsibility.

"On this side of the line the computer will handle these tasks. On the other side of the line humans will handle the other responsibilities." Right now, said Brooks, "that line is blurry." ✤

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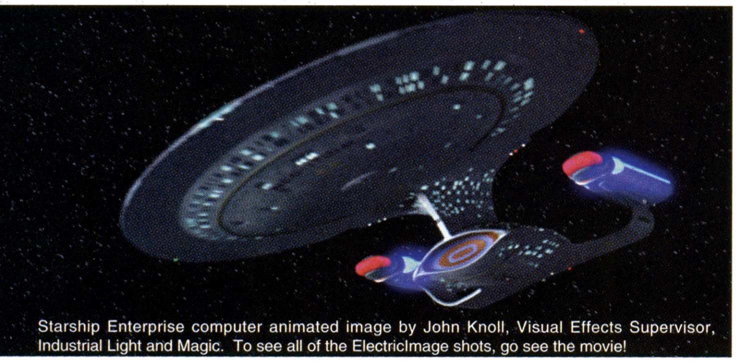

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Mail Bonding: Foray into Digital Filmmaking

High-end video project shoots for film benchmark.

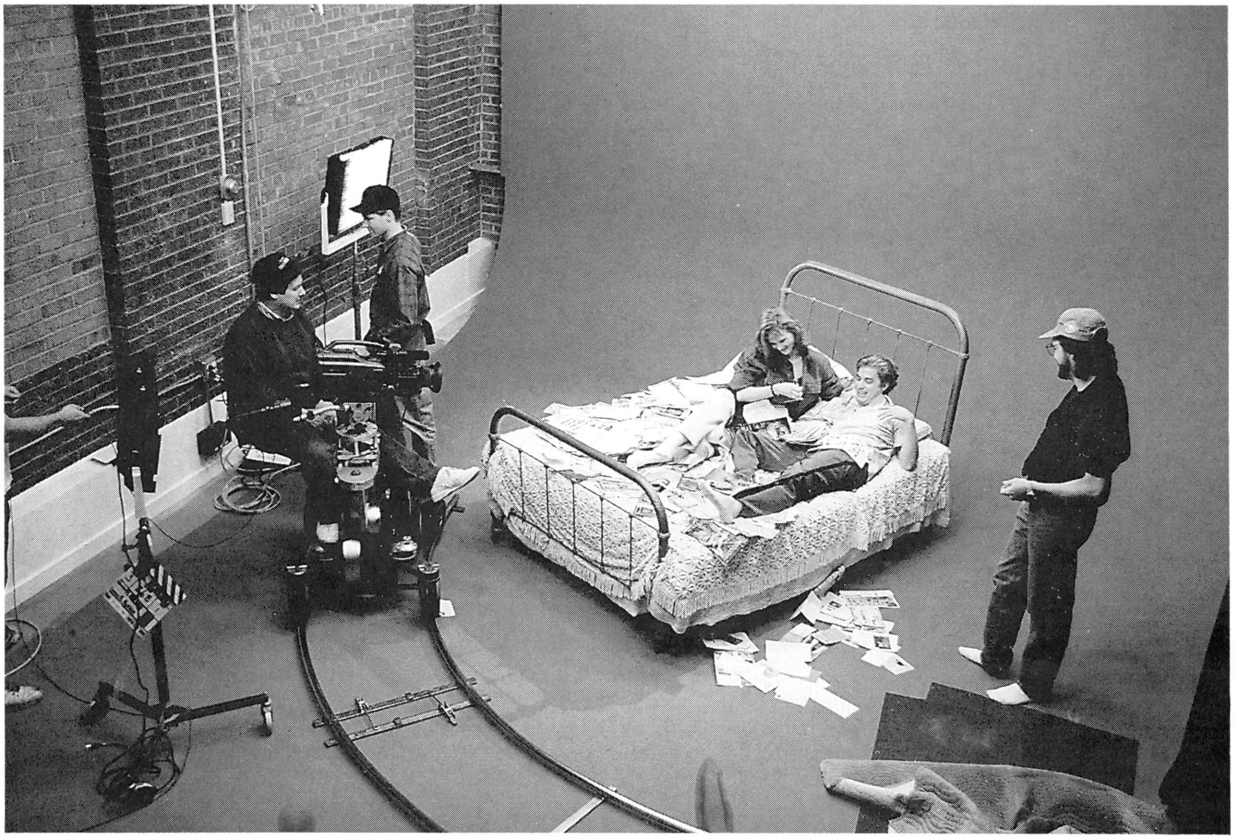
by Debra Kaufman

The most technologically interesting movie at the 1995 Sundance Film Festival may have run on its smallest screen. At the Apple Computer exhibit at the Festival, on a Macintosh Quadra 630 running a CD-ROM, the first all-digital live-action movie gave filmmakers a 12-minute taste of digital filmmaking. The movie in question was *Mail Bonding*, a mostly black & white, silent short by director/producer Robert Miller.

Mail Bonding relates the quirky adventures of a down-and-out beat poet holed up in his dark apartment who falls for a winsome postal carrier and tries to win her affections. What he doesn't know is that her heart belongs to another postal carrier who was killed by a dog in front of his door. With color dream sequences, the whimsical tale of love, death, and the U.S. Post Office reveals a textured palette of darks and lights in both its images and emotional overtones. And, by the way, it was shot in digital component video.

The Berlin Wall between film and video may or may not be tumbling down. But if the recent all-digital production of *Mail Bonding* is any indication, there may be some serious cracks in the separation between these two media. Computers have led the first incursion of digital technology in filmmaking with their ability to create dazzling visual effects in a resolution-independent environment and record those images out to film.

But until now, digital images have been created in a computer. After all, there is no digital camera, right? Wrong. Sony Electronics Inc. now manufactures a Digital Betacam camcorder, the DVW-700 series. According to Duane Dahlberg, Sony Electronics' market devel-

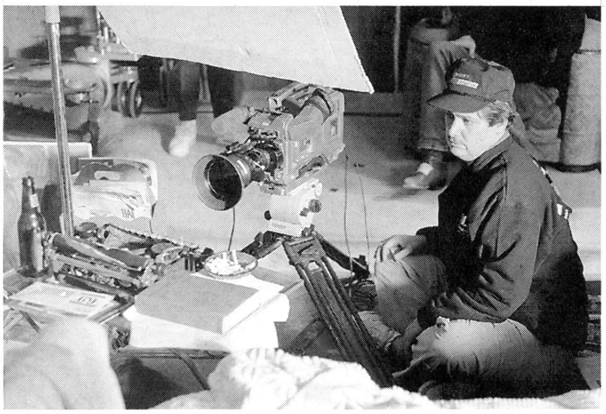


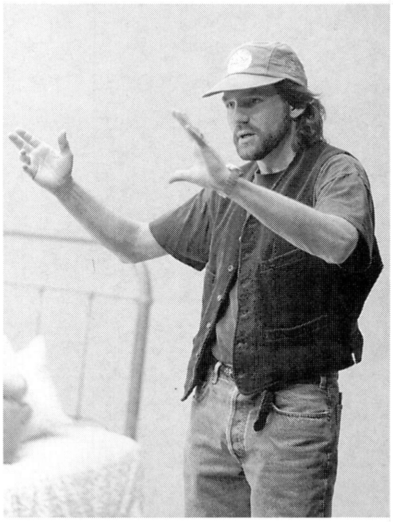
Shooting on the blue-screen stage at Pacific Video Resources.

Photos by L. Sprague Anderson

opment specialist for broadcast cameras, Hyper-HAD 1000 Frame Interline transfer (FIT) CCD technology combined with advanced digital signal processing (DSP) microcircuits and Digital Betacam video recording technology has resulted in "a breakthrough in high-end portable video camcorders.

"Because of the performance of this product from the technical standpoint — colors reproduced, picture quality sharpness and resolution — we now for the first time have a product that can compete against 35mm film from a performance standpoint," says Dahlberg. "By no means are we saying we're going to replace 35mm or Super 16mm. We're not replacing film for theatrical releases. But when you're producing on film and it'll end up on television, the DVW-700 Digital Betacam camcorder gives film a good run for its money."





Clockwise from top: ***Director of photography Steve Kotton; director Robert Miller; lead actors Beth Richmond and Craig Anton.***

To many, that's a familiar refrain. *Mail Bonding* director/producer Robert Miller listened carefully. Over the last seven years, Miller has been writing screenplays and studying how the film industry works, while producing videos for Stanford University's national Instructional Television Network, where he was exposed to cutting-edge technology. These experiences led to an inescapable conclusion.

"I saw that making movies is not an inexpensive process, even if you're very judicious," notes Miller wryly. "You're shooting on precious metal and there's no way around it. With computer technology, you're shooting onto silicon, which is essentially dirt. It makes the costs involved very different: film is just more expensive than video. But video's drawback is that it doesn't look like film."

Intrigued with the challenge of finding a way to make digital images contain the "same visceral qualities of film," Miller searched for a more economically feasible substitute for film that was as close to film's look as possible. At the same time, Miller was working on an idea for a screenplay with his friend Alan Jacobs, who was in the process of shooting *Nina Takes a Lover*, in 35mm. Jacobs concocted the idea behind *Mail Bonding* and shared it with Miller. When *Nina* was picked up by Columbia Pictures, Jacobs dropped out of *Mail Bonding* to close that deal (*Nina* is due to come out in March 1995) and gave Miller his blessings for going ahead alone with *Mail Bonding*.

He also gave Miller a piece of advice that would change how *Mail Bonding* would be made. He suggested that Miller check out the digital equipment at Pacific Video Resources (PVR), a production/postproduction facility that has pioneered analog component, digital component, and MPEG technology since its 1980 founding by partners Jim Farney, Steve Kotton, and John Zimmerman. Miller didn't know this when he played hooky from work to attend a PVR open house. Once inside PVR, Miller proclaimed its array of high-end digital technology "the promised land." And in the middle of that promised land was Sony's Digital Betacam camera.

"When I saw that, it started a spark within me that it might be the chance to shoot an all-digital movie," recounts Miller.

That Digital Betacam camcorder was also Sony's sole wide-screen model (several other DVW-700 production models in existence feature the standard 4:3 aspect ratio). Demonstrating the digital camcorder was PVR partner Steve Kotton, who had already run some preliminary tests with the camcorder. Miller approached Kotton about the possibility of shooting an all-digital movie using the Digital Betacam camera.

"I tried to keep my excitement contained," admits Miller. Miller was taken with the fact that the images are scanned by the camera and put digitally onto Digital Betacam tape, with no analog steps in the process. Kotton filled Miller in on some of the specifics: that the DVW-700 Digital Betacam camcorder produces images in full bandwidth 4:2:2 digital component recording; that its 80 dB dynamic range translates to almost 11 f-stops of exposure latitude, and the dynamic range, combined with a 62 dB luminance signal-to-noise ratio, allows capture of image detail in low-light scenes or shadowed areas; that the VTR signal-to-noise ratio of 62 dB matches that of its CCD imaging system, and the 10-bit component recording format captures the full dynamic range imaged by the CCDs; that the camcorder's high sensitivity (2000 lux, at f/8.0) translates to an equivalent film Exposure Index of 580 in studio tungsten light and 650 in daylight.

The Digital Betacam camcorder promised the possibility of shooting a video whose images would come closer to rivaling film images than any previous video format. The idea of making the first all-digital live-action movie became increasingly intriguing — both to Miller and Kotton.

"I could have shot a video," says Miller. "But it would have just been another video and it wouldn't have been aesthetically to my liking. My aesthetic preference is filmic images." Pacific Video Resources' long history of tests and experiments also made the *Mail Bonding* project a natural. "Digital component recording in the field isn't new for us," explains Kotton. "We took two D-1 machines and did a technology test for Sony in 1988, with a generator truck trailing us with a 20-meter cable. We've done a few projects for Sony before, showing off digital compositing and using D-1 editing. *Mail Bonding* was just an extension of that."

Pacific Video Resources signed on as a participating party in all aspects of the movie, for the prestige inherent in making this first all-digital live-action movie. And Kotton, who is both a DGA member and experienced cinematographer, came on board as director of photography. Kotton's earlier field report on the Digital Betacam camcorder convinced him that it was ready for a real-life test.

Sony Electronics agreed. The long, fruitful relationship between PVR and Sony led to Sony's agreement to de-rail the Digital Betacam camcorder from its worldwide tour and loan it, free of charge, to the *Mail Bonding* project for a few days. From Sony's point of view, there was an obvious value in assisting the first "out-of-house" Digital Betacam production, especially one in the 16:9 aspect ratio.

Miller, who also produced the film, jumped into the task of finding locations, studio space, and appropriate talent. PVR's landlord, Greg Markoulis, gave Miller what the director/producer calls "a gracious deal" for three months' use of a 4,000-square-foot space. As production offices were being built in the rented space, Miller began collecting a professional film crew and additional sponsors. Apple Computers — which donated use of large-screen color monitors, high-resolution printers and Quadra computer systems — and Avid Technology, which donated the use of an Avid Media Composer 800, joined the *Mail Bonding* project as sponsors.

Miller's familiarity with computers led to their use throughout the production process. "We had a complete Macintosh network on site," says Miller. "We used it for all office administration and organization, all printed materials, storyboarding, graphic design and layout, previsualization."

In the pre-visualization stage, Miller used the software program ArchiCAD to build a virtual set. That allowed him to try out shots using the computer's camera prior to building the actual set.

"We could see the angle we wanted and see where we needed an extension of the set or a wall," remembers Miller. "That's how we knew we had to construct ceiling panels, so we could put them into areas when we were shooting low angles. We hadn't anticipated this until we had the 3-D model. If we had had to stop production to construct those panels, it would have killed us."

The four-day shoot took place over Thanksgiving week, all of it shot on stage, with the exception of a half-day on location in San Francisco's Potrero Hill area and a half-day on PVR's blue-screen stage.

From the technical point of view, part of the rationale behind *Mail Bonding* was to show that the Digital Betacam camcorder could produce images sufficiently "filmic" to offer an alternative to film in some situations. For that reason, lighting director Mike Van Dine lit the stage set at around ASA 400 — "as if we were shooting film," says Kotton or, as Miller says, "the camera was rated as if it were at a film speed of 320, so we lit it for that."

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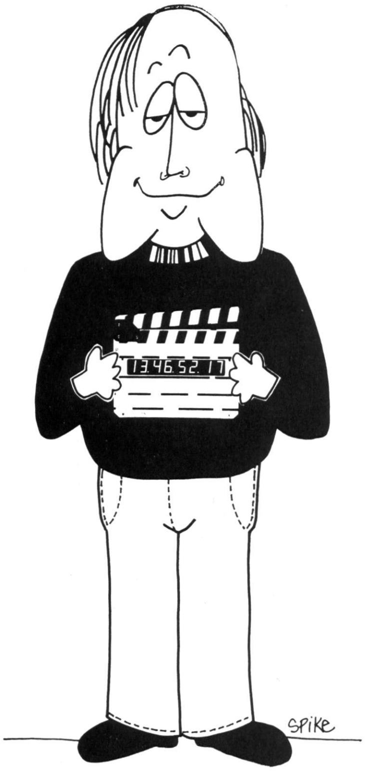

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Kotton also observes that the Digital Betacam camcorder is "malleable" with "hundreds of parameters you can tweak to your heart's content to get a specific look." From his point of view, what makes it better is that all those parameters are programmable, a feature which he says helped him to save on setup time. And, since digital technology doesn't drift, the settings remained rock solid, saving Kotton from constant tweak time associated with analog camcorders. From start to finish, say Kotton and Miller, the production went smoothly, without a moment of down-time.

Digital technology played another interesting role during the production. Miller digitized the images directly out of the camera into the Avid Media Composer, which allowed him to use the electronic nonlinear editor as a multi-purpose tool. The Media Composer came in handy, first of all, for continuity. Because the movie was shot completely out of sequence, the potential for problems was great.

"We'd shoot everything in one direction and then tear a wall down and shoot from another direction," describes Kotton. "With the Avid, it was quite easy to go back to the early scenes and see exactly what we were going for. It was a big help and cut out a lot of time."

Having the Avid Media Composer on set also allowed offline editor Jennifer Hudgins to do some rough cuts while the movie was being shot. Once again, Miller and Kotton caught problems during production instead of in post. For example, in one sequence, they shot a hand going down on the carpet from an overhead angle. When Hudgins edited the scene, Miller and Kotton clearly saw that the angle was wrong. Because they still had the correct lighting setup, they were able to re-shoot it easily.

"The Avid Media Composer is an immensely powerful tool," comments Kotton. "The images were digitized instantly, so we could see the sequences right away. It blurred the line between production and post."

After the four-day shoot, Miller wiped out the footage on the Media Composer's 9-gigabyte storage. So that time code would be available for the editors, the reels were then re-digitized into the Avid, a process that took about 10 hours for 5-½ hours worth of material.

Mail Bonding will be shown at the San Francisco International Film Festival. Sony is helping out again by recording the Digital Betacam images — all 12 minutes — onto 35mm film. For Miller, whose undisclosed budget was minuscule and out-of-pocket, Sony's contribution allows him to get *Mail Bonding* out to the public. From Sony's point of view, *Mail Bonding* is a way to show professionally produced color images as an example of what can be done with the new Digital Betacam series.

Miller plans to market *Mail Bonding* with an all-digital trailer to be released to computer networks for the perusal of Internet surfers. He will also make *Mail Bonding* available to cable and "anyone interested in showing an all-digital production."

Like any director or producer, Miller sincerely hopes his work on *Mail Bonding* will lead to something else. A full-length feature is high on his wish list. Pacific Video Resources, Apple Computers, and Avid Technology all have the satisfaction (and prestige) of having played a role in a pioneering digital component production. And, for Sony Electronics Inc., the hope is, undoubtedly, that *Mail Bonding* will catch the eye of cinematographers as well as television producers hoping to trim the budget. Director of photography Kotton concluded that "the camera didn't miss a beat. Sony was very impressed with the images we got."

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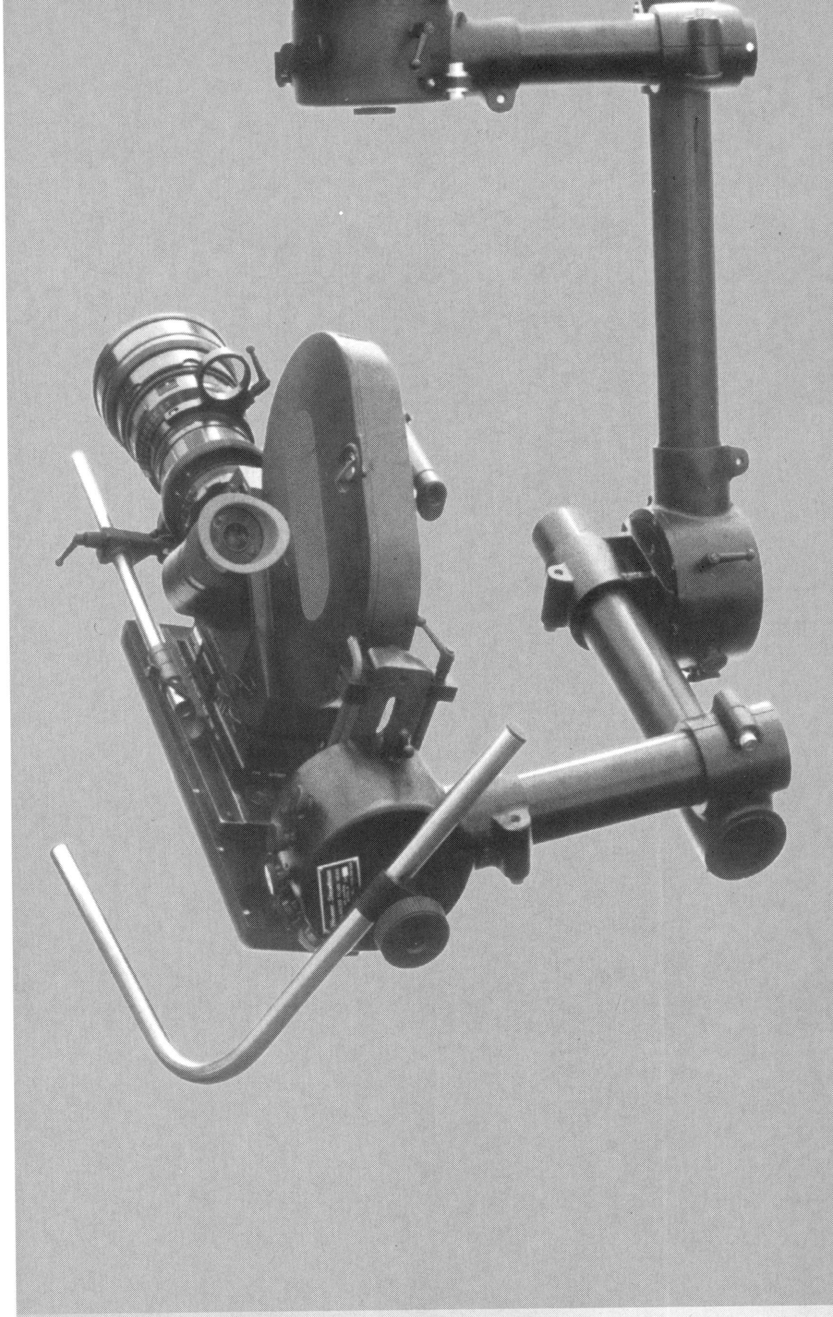

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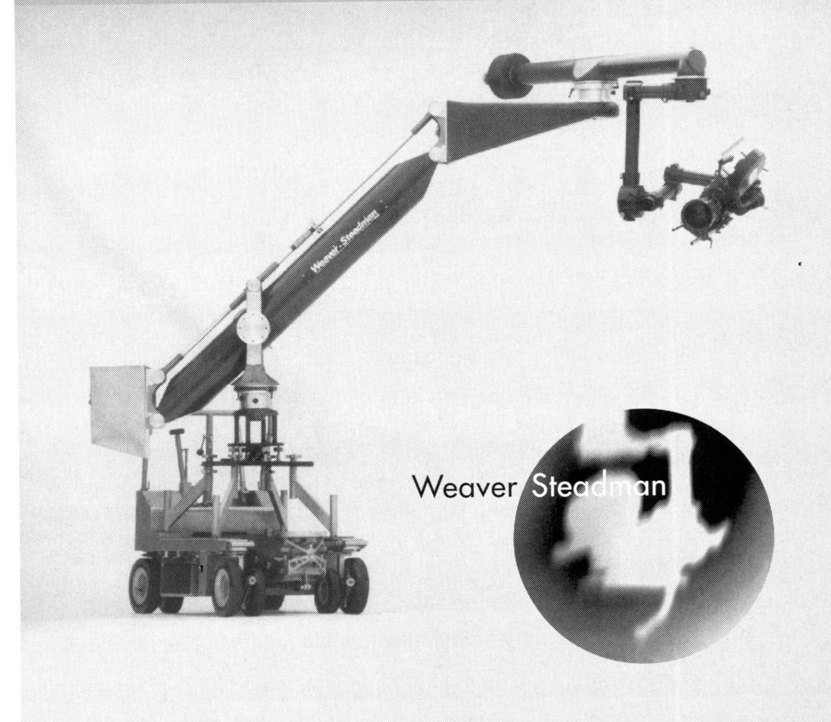


Death and the Maiden: Trial by Candlelight

Director Roman Polanski and cinematographer Tonino Delli Colli answer questions about their respective careers and most recent collaboration.

by Stephen Pizzello

Roman Polanski's films have consistently probed the darkest tarpits of the human psyche, where suppressed emotions invariably bubble to the surface in outbursts of cruelty and retribution. In his first feature, 1962's *Knife in the Water,* a seafaring couple invites a young man on a sailing trip which slowly degenerates into a primal battle of masculine wills. In *Repulsion,* a sexually repressed London manicurist falls prey to frightening hallucinations that lead to murder. *Cul-de-Sac,* with its archly comic overtones of Beckett and English social satire, reveals a menacing subtext that foreshadows Peckinpah's *Straw Dogs,* while both *Rosemary's Baby* and *The Tenant* foster an encroaching ambience of paranoia and dread. No less angst-ridden are *Macbeth* (the classic tale of overweening ambition turned evil), *Chinatown* (in which a resolute detective unearths a tenebrous web of municipal corruption and incest), *Tess* (Thomas Hardy's tale of an innocent, impoverished girl whose life unravels when she marries an aristocrat), *Frantic* (which tracks a surgeon's descent into the Parisian underworld as he hunts for his kidnapped wife) and *Bitter Moon* (wherein an idyllic romance degenerates into sexual perversion and moral degradation).

Given his propensity for pitch-black themes, it's hardly surprising that Polanski was attracted to Ariel Dorfman's play *Death and the Maiden.* Set in an isolated seaside house in an unnamed country, the nerve-rattling drama begins on a stormy night, as Paulina Escobar (Sigourney Weaver) awaits the return of her husband Gerardo (Stuart Wilson), a leading human-rights activist helping to foster democracy after years of brutal dictatorship. Having suffered a flat tire, Gerardo eventually shows up in the car of "good Samaritan" Dr. Roberto Miranda (Ben Kingsley), whom he invites in for a drink. As Paulina eavesdrops on the men's conversation, she becomes convinced that Miranda is the same physician who tortured her when she was a prisoner of the state. Jumping at the chance for revenge, she turns Miranda into a captive and forces him to submit to an impromptu interrogation that lasts until dawn, when the truth is finally revealed in a tense cliffside climax.

In discussing their work on the film, Polanski and director of photography Tonino Delli Colli touched upon a wide range of topics relating to their topflight filmmaking careers. What follows are excerpts from those conversations, preceded by brief biographical sketches.

Q & A: Tonino Delli Colli

(Translation provided by Alessandra Coli)

Born in Rome in 1923, Tonino Delli Colli came to love movies at an early age. He started out in what he jokingly refers to as "this terrible business" when he was 18 years old, serving apprenticeships as a camera assistant and camera operator. When he was just 20, Delli Colli shot his first feature as a director of photography, *Finalmente Si.* Since then, he has lent his talents to a mind-boggling total of 186 films, collaborating frequently with some of the world's greatest directors, including Pier Paolo Pasolini, Federico Fellini, Louis Malle, Sergio Leone, Lina Wertmuller, Jean-Jacques Annaud and, most recently, Roman Polanski. Many of the titles on Delli Colli's list of credits are required viewing for any self-respecting cinéaste: *Accatone; Mamma Roma; The Gospel According to St. Matthew; Pigsty; Salo; The Decameron; The Canterbury Tales; Once Upon a Time in the West; Once Upon a Time in America; The Good, The Bad and the Ugly; Seven Beauties; Lacombe Lucien; Ginger and Fred; Intervista, Voice of the Moon; China is Near; Tales of Ordinary Madness;* and *The Name of the Rose.* His collaboration with Polanski began on 1993's *Bitter Moon,* a caustic black comedy that tracks the disintegration of a passionate affair.

AC: You've worked with a wide range of great directors in a variety of styles. Are there any photographic principles you carry from film to film?

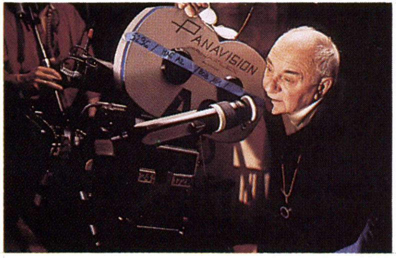
Delli Colli: Not really. I

Photos by Francois Duhamel, courtesy of Fine Line Pictures.

change style quite a bit from film to film based on which director I'm working with, so I don't feel as if I have a set style. But even though I always try to adapt to the director, I have often had a good deal of input.

You photographed 11 films for Pasolini. How did he compare with the other directors with whom you've worked?

Delli Colli: Pasolini was very different from all the others. He didn't care for technical tricks. He preferred having a dialogue between two people, with no fancy camerawork. Pasolini once had me watch Chaplin's *Limelight,* in which the camera is fairly static. When I did *Accatone,* which was in black & white, Pasolini showed me Dreyer's *Joan of Arc,* because he wanted a similar natural-light effect. He wanted to push the grain as much as possible, and he was also very concerned with the photography of the actors' faces. Personally, I always preferred black & white to color. With color film, the colors themselves provide much of the ambience. With black & white, you create the atmosphere with lighting.



With Pasolini, we worked quite a bit from 14th- and 15th-Century paintings, as well as more modern paintings. He always worked from paintings, which gave the production designer, costume designer and me a good starting point. It was very easy to work with Pasolini, because he always picked the right actors. He used to tell me that I was the only one who understood him and knew how to work with him, but I don't even know how I did it! It was just natural instincts.

Leone and Fellini were obviously much fonder of complex camerawork.

Delli Colli: Leone was extremely refined and very sophisticated in terms of the camerawork. He was very concerned with details in the shots, and liked to plan everything out; Leone's work was like the difference between hand-made and industrial lace. We would often start wide and move in to big close-ups. His films were very long, and deliberately paced. In the case of *Once Upon a Time in America,* the version released in the States was completely ruined by cuts that shortened the length. It was too bad, because I think that film could have been nominated for the Academy Awards. This also happened with *The Name of the Rose.*

Above: *Convinced that Dr. Roberto Miranda (Ben Kingsley) is hiding his dark history, Paulina Escobar (Sigourney Weaver) uses force to shed light on the mystery.* **Left:** *Cinematographer Tonino Delli Colli at the controls.*

Fellini was exactly the opposite of Sergio Leone in his working method. He was a great improvisor. Fellini didn't like special effects at all, because they were out of his immediate control and involved a lot of pre-planning. All he would accept were very old-fashioned effects. He never stuck to his scripts. In the evening, Fellini used to say to me, "Don't ask me what we're going to do tomorrow, because I have no idea!"

Malle and Wertmuller are also studies in contrast.

Delli Colli: That's true. I worked very well with Malle. He's a bit like Polanski — very precise, and very professional. Lina Wertmuller, on the other hand, is very nice and very friendly, but she's a lot more haphazard in her approach. However, she's made some beautiful films that have done very well at the box office.

You also had the chance to work with Orson Welles.

Delli Colli: I did some photography for Orson Welles on *Othello,* but then I went off to get married! I shot most of the scenes that take place in Venice, but Welles finished the film at a later time. I had also worked as a camera operator with Orson on the first Italian-American coproduction after the war, *Cagliostro* (a.k.a. *Black Magic*). Just after we started shooting, I had a big argument with him! In Italy, after the war, we didn't have the kind of equipment they had in the States. We were using a DeBrie camera, which was rather noisy. We had made a sort of muffler for it, but it bothered me to use it, so sometimes I would take it off. One of the American sound men kept complaining about the camera noise, and he told Orson about it, who started screaming and yelling all sorts of things about me. I said, "Fine, then I won't work on the picture." When Orson calmed down, he had a meeting with the director of photography and me, with bottles of champagne, and he apologized. We became good friends after that, and later on he sent me a script and a proposal for a contract under which I would have worked for him for seven years! I didn't accept, because I was still only 25 years old at the time.

What's your working relationship like with Polanski?

Delli Colli: I've known Polanski for a number of years, but we had never worked together until *Bitter Moon.* I've always admired his work. Both of the films I shot with him were great experiences. He's very polite and very professional toward everyone on the crew. He's very easy to work with, because he always knows what he's going to do when he steps on the set. Polanski has a general rehearsal with the actors, and they go through the whole scene. But he has already edited the film in his mind, and he knows what is going to end up in the final cut. That helps me in my lighting, because we know which part of the scene is going to end up in the frame. It's all very clear from the beginning. That aspect of his method was particularly helpful on *Death and the Maiden,* because all of the lighting was provided by candles.

What was your technical approach to the candlelight?

Delli Colli: The first problem in working with candles is that the light usually comes from below the actors. On *Death and the Maiden,* I generally shot at a stop of 3.5. We used special little 50- and 150-watt lights to imitate the light of the candles. We switched back and forth between the different bulbs depending upon how close the candles were to the actors. The fixtures had to be small, because they were very close to the candles, and anything stronger would have melted the candle wax too fast. We didn't use any flicker, because candlelight doesn't move as much as the light from, say, an oil lamp. On *The Name of the Rose,* we used a lot of oil lamps, and we enhanced the look with flicker gags.

The film was shot in continuity. How did that affect your work?

Delli Colli: We didn't have many chances to stop and reset things. That made things a bit difficult, because we were constantly following the actors around.

The advantage of shooting in continuity is that you know where a certain scene belongs in the overall sequence. When you know what's going to happen, it's easier for everyone on the set to work.

What camera package were you using on this shoot?

Delli Colli: We used a Panavision Gold system. We used the Primo lenses, and we were often at 18mm, 21mm, 24mm or 30 mm. Polanski likes to go very close to faces, so we used a lot of wide angles. I was using Kodak's 5296 film, and we shot in the 1.85 format. For exterior scenes, we used the normal filters, but we didn't add much filtration inside.

Most of the film's action takes place inside the house. Did you do anything to enhance the sense of confinement and claustrophobia?

Delli Colli: The setting itself was fairly conducive to that atmosphere. There are just a few rooms in the film, but you also see the outside of the house at certain points. For the exterior, we had a matted sky and landscape, but we also shot some footage on location in Spain. The action begins at dusk, which turns into night. The house is near the sea, so you also hear the sound of the waves and the wind. But most of the suspense was generated by the style of lighting. When the lights go out, the characters use candles, and then an oil lamp and a flashlight. All of these things, of course, were in addition to the overall lighting for the scenes; the audience has to see what's going on. The main light was on the actors and actresses, but the background lighting

NANCY SCHREIBER
ON FILM

"It is very difficult for me to explain cinematography with words. It's like being a painter who begins each day with a blank canvas. You paint with light and use color, contrast and shadows to get to the kernel of the emotion and the center of the story. Every day is different. You make choices about lighting, camera movement and composition in conjunction with the director and actors. You have a blueprint to follow, yet still must be aware enough to react viscerally to what is happening in the moment. I don't want my work to stand out from the film as a whole. It has to be organic to the story. You are always being challenged to take chances. That's when it can become an eloquent art of expression, communication and passion. Sometimes this is a difficult job, because I'm a perfectionist, and there is never enough time. But, I've found my calling."

Nancy Schreiber

Nancy Schreiber's credits include *Lush Life, Chain of Desire, Visions of Light, Deadbeat* and *Girl in the Cadillac*. Her current film is *Scorpion Spring*. She also has numerous documentary, music video and TV commercial credits.

Kodak

The Filmmaker's Film Maker

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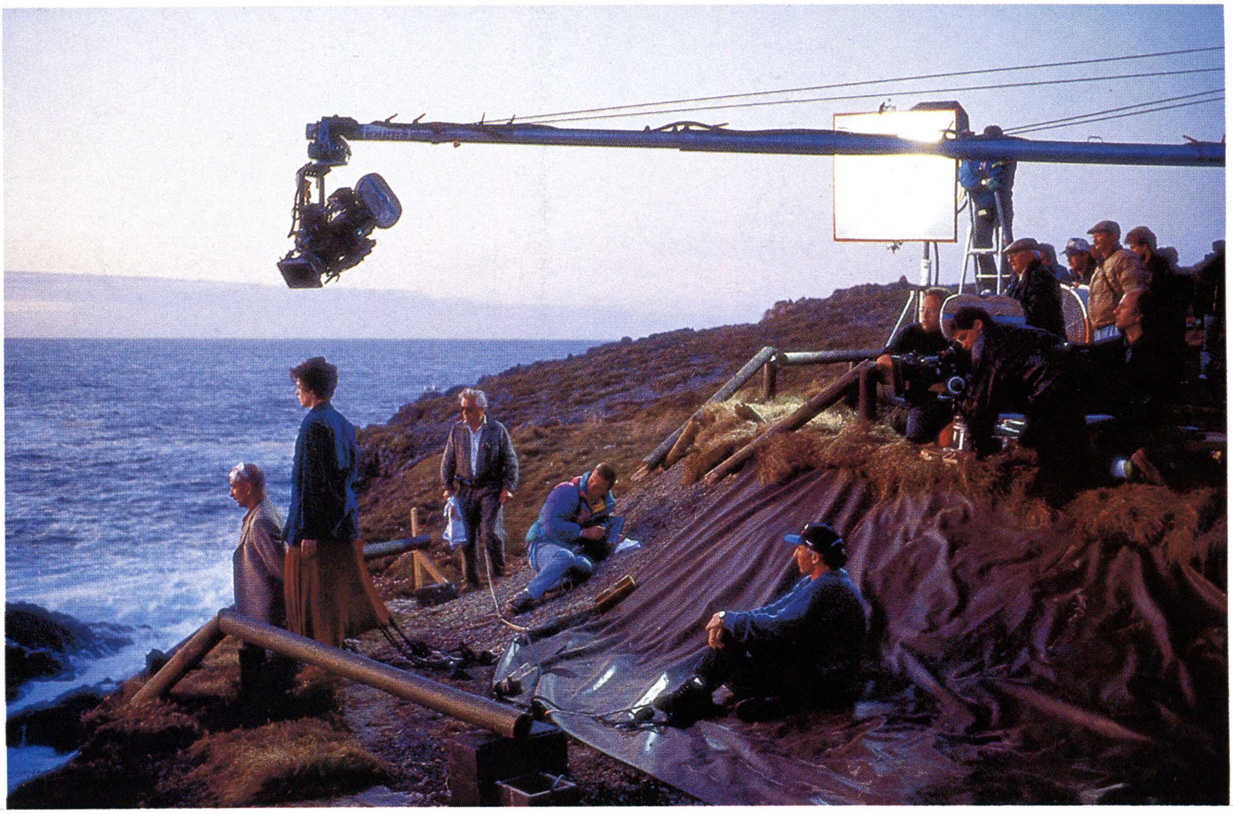


Right: *A remote camera is used to capture the film's climactic cliffside confrontation.* **Below:** *Director Roman Polanski, a master of suspense, plans out the finale of* **Maiden.**

would change as the camera moved closer or further away.

What did you do to create visual interest in such a limited setting?

Delli Colli: In some scenes, we went into the bedroom, where there was no light at all — just the moonlight from the window. In that part of the house, we worked in silhouettes, but those scenes are not very long. There's a very long scene on the balcony outside, which we shot in the studio.

There are a few different looks in the movie — first it rains, and then the moon comes out. To simulate the moon, we used a 6K HMI.

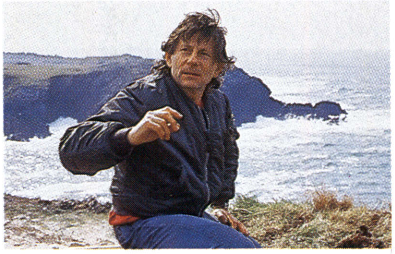
What are your views on shooting at a location rather than in the studio?

Delli Colli: Working in a studio is faster, because you can simply shift all of your walls around. There was not much camera movement on this film because the space was so confined.

On this picture, we used both the real exterior of the house and a set created in the studio. It's not always easy to merge the two. On the studio set, we used a matte painting as our background, and I had to use the lighting to make it match.

How did you approach your lighting for the actors?

Delli Colli: I lit the actors based on the location of the light. I wanted the most realistic rendition of each face in the light. I didn't use much diffusion. Given the type of light we were using, the faces were always pretty hot, because the surroundings were quite dark. For me, the most important thing is the position of the actors, but the contours of their faces also make a difference. The best way to shoot Sigourney Weaver, for example, is three-quarters front at eye level; she's very camera-friendly. I think European cinematographers really like to concentrate on the faces of the actors. Personally, I like to focus on the main light source for the face rather than the environment around the face.



The film does have a very uncluttered look.

Delli Colli: I always prefer a clean look; I try to use as few lamps as possible in a scene. There's a general light for the scene, and a more specific light for the actors. If the general light is good enough for the actors, then I don't use a separate light on them. Too much light creates confusion. Of course, this depends upon the size and scope of the scene. You cannot achieve certain effects with strong lights; sometimes you need less powerful lights. For instance, when we were shooting the apartment scenes in *Bitter Moon,* the ceiling was always in view, which affected the light levels. Polanski likes to keep the camera near the floor, so this is always a consideration in his films. I like this ap-

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proach, because it makes things more realistic; without a ceiling, it looks as if you're on the set. We were striving for a very realistic effect in the look of this film.

Having worked closely with Polanski on his last two pictures, do you get the sense that he misses working in the U.S.?

Delli Colli: From what I can tell, Roman really loves the United States. I think the law barring him from the States is very strict. In Italy, I don't think they would be so stringent. They should try to find a solution, because I think Roman would really like to work in the U.S. again. There's a lot more money there for financing, and he could make more elaborate movies.

Q & A: Roman Polanski

The facts of Polanski's turbulent life are well documented. Following his birth in Paris in 1933, Polanski's parents moved back to their native Krakow when he was still an infant. During World War II, Polanski narrowly escaped the Nazis during the liquidation of the Krakow ghetto. His mother and father were subsequently sent to concentration camps, and his mother perished at Auschwitz.

After the war, Polanski attended art school, and in 1955 he enrolled at the Lodz Film School. One of his school projects, the absurdist short *Two Men and a Wardrobe,* attracted considerable international attention after earning a bronze medal at the 1958 World's Fair in Brussels. He soon exploded onto the world stage when his first feature, the tension-packed *Knife in the Water* (1962), earned an Academy Award nomination for Best Foreign Film. From this auspicious beginning, Polanski went on to direct a series of superb films that include *Repulsion* (1965); *Cul-de-Sac* (1966); *The Fearless Vampire Killers* (1967); *Rosemary's Baby* (1968); *Macbeth* (1971); *Chinatown* (1974); *The Tenant* (1976); *Tess* (1980); *Frantic* (1988); and *Bitter Moon* (1993). Polanski earned Academy Award nominations as Best Director for *Chinatown* and *Tess,* and both films were also nominated for best picture.

AC: How did the Lodz Film School prepare you for your career?

Polanski: It helps anyone to know about the technology of their profession. You're much more at ease. When I went to Lodz, the curriculum was pretty rigorous. To start with, photography was the most important subject in all divisions. There were classes for directing, producing and camera when I started at the school; later, they added acting as well. I was in the directing program. However, all of us in the different divisions had subjects in common. The most important to all four divisions was photography. The school's basement was used as a lab, and the first thing they did was to take us down to the darkroom. They gave each of us a leaf on paper, and we would shine light on it and develop the paper. Then they gave us a big glass plate to make a copy of it and get the correct exposure by making strips on it. We covered it with paper, or with something nontransparent, like a board; we'd move the board a quarter of an inch and expose it, then move it again. In this way, we got strips with various exposures. Then we'd develop them.

After that, we gradually progressed until we were developing films in the different parts of the lab, and taking our own pictures. Finally, they would give a camera to every student. After the second year, we had to present a portfolio of photographs. You could slag off other exams, but never photography; you would be kicked out immediately. In the second year, we did our first two exercises, which were one minute and three minutes long. They taught us lighting by having us take pictures of plaster busts and heads and then developing blow-ups of them. It was a five-year program, and in the fifth year was mostly for practical things, like shooting our final short films. We used only 35mm film.

In parallel, there were courses in optics, history of cinema, and so forth. We were also given tours of labs in a nearby studio, and everyone did a few months as a set assistant or something like that. We also took editing classes, and had masses of screenings all the time.

What were some of your early visual influences?

Polanski: The very first film that really had a great impact on me was one I saw well before I went to film school, when I was about 15 or 16. That was *Odd Man Out,* by Carol Reed, starring James Mason. I saw it again not long ago and I was astonished by how good it still is. Seeing this picture was an extremely important experience for me. It has a very stylized, studio-like atmosphere. There is a certain degree of realism, but the world in the film is not the real world. The unity of time is also important; a clock appears throughout the film, and you can feel the passage of time. Also, the weather changes from sunny to rainy to snowy to icy. I was very accustomed to living that way in Krakow, and certain scenes from that film, with snow falling in a back yard, reminded me so much of the atmosphere in which I lived. Something I only understood only very recently is that this story tells of a fugitive, and I could identify with James Mason probably more than someone who hadn't gone through some of the things I had in my childhood.

Later, there was Laurence Olivier's *Hamlet.* I saw that film about 24 times. Like *Odd Man Out,* it was all done on sets, but I felt like I was there when I was watching it. Again, I felt an identification with the hero of the piece, and there was an over-

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Stages

STAGES	Length	Width	Height	Sq. Ft.
1	100′	92′	29′0″	9,200
3	154′	80′	27′2″	12,320
4	154′	69′	27′10″	10,626
5	139′	64′	23′4″	8,896
6	139′	63′	19′10″	8,757
12	199′	146′	49′2″	29,054
12W-Fire	99′	68′	28′2″	6,732
16	144′	80′	28′8″	11,520
17	144′	70′	28′10″	10,080
18	144′	74′	29′1″	10,656
19	144′	74′	27′10″	9,934
20	144′	74′	27′1″	10,656
22	157′	74′	27′0″	11,618
23	157′	76′	28′1″	11,932
24	157′	112′	33′4″	17,584
25	157′	112′	33′4″	17,584
27	199′	99′	39′10″	19,701
28	142′	98′	43′11″	13,916
29	141′	97′	30′0″	13,677
30	141′	88	30′0″	12,408
31	141′	97′	30′0″	13,677
32	141′	89′	30′0″	12,549
33	99′	69′	25′0″	6,831
34	99′	69′	25′0″	6,831
35	99′	69′	25′0″	6,831
36	99′	69′	24′11″	6,831
37	140′	100′	30′0″	14,000
41	140′	102′	30′1″	14,280
42	140′	102′	30′0″	14,280
43	140′	102′	30′3″	14,280
44	140′	102′	30′0″	14,280
747	139′	59′	21′2″	8,201
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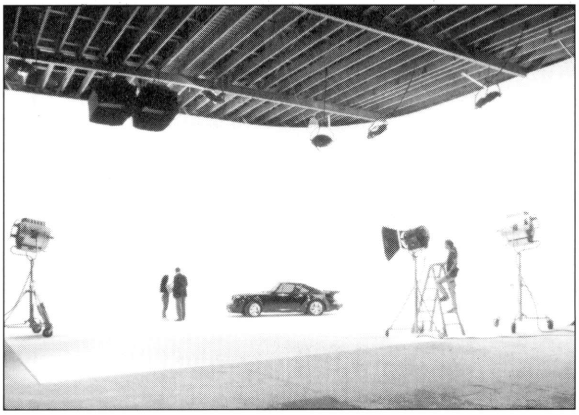

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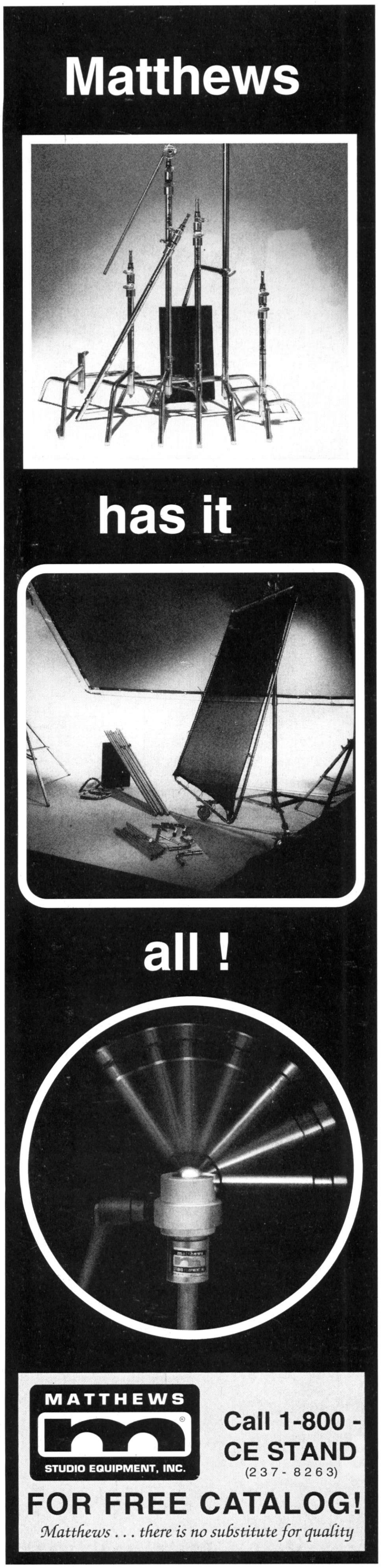

whelming atmosphere in that strange castle. I've always liked films that happen in interiors more than epics with lots of cavalry running in all directions. I like to feel the movie all around me, so I can forget that I am sitting in the cinema looking at a flat screen. When I watched *Hamlet,* I could feel the architecture closing in behind my back.

Naturally, there was also *Citizen Kane.* That film had everything. It was just astonishing — the structure of the story, the lighting, the angles, the depth of field, the acting, the richness of it, the constant surprise, and the unconventionality. I was a little older when I saw it, and I was more able to understand all of these qualities.

What first attracted you to Ariel Dorfman's play *Death and the Maiden?*

Polanski: It was a combination of the subject and the scenario. I was interested in the philosophy behind it, and the relativity of the truth. It reminded me a bit of *Rashomon,* another one of my favorite films. I've always wanted to do something like that, with shifting perspectives, and I would still like to do a film which really tells a story from several points of view, where no one is totally reliable. *Death and the Maiden* has certain aspects of this problem; you don't know who's telling the truth. I also liked the possibilities for [creating] suspense. It's basically a thriller.

What led to your decision to keep the setting playlike and claustrophobic, rather than "opening it up" for the big screen?

Polanski: This strategy of "opening it up" is usually arbitrary and artificial; you sometimes feel that the characters are just going outside to "air out" the play. For me, it never works. To render a stage play cinematic doesn't lie within opening it up and taking the action to attractive locations. It's more within the filming and in the way you show the people evolving within the place, which mustn't be stagey. It can be just as stagey on a beach or on a street as it can in a house.

How did your collaboration with Tonino begin?

Polanski: I admired his work, and I called him one day and asked if he'd like to do a picture with me. We worked on *Bitter Moon* together, and it went very well, so I thought it would be natural for us to do another film together.

How do the two of you break down the visual decisions on set?

Polanski: I rehearse the actors, and he watches it. I work with the viewfinder to determine what I'm going to see with the camera, and he observes me and talks to his guys at the same time. It all happens simultaneously.

What did you try to accomplish with Delli Colli during rehearsals on this project?

Polanski: In this film, there is unity of action, time and place, so we had to be very specific with the props. They had to be placed by the actors in such a way that they could be used once again, because there were no "time gaps" to allow us to place the props in more convenient locations. For example, the props in this film occasionally provided sources of light, like the flashlight. At the beginning, the husband takes the flashlight into the bathroom and leaves it there. Later in the film, we need this flashlight again, so he has to fetch it from the bathroom, because this film has the continuity of the action; there are no ghosts in the house who could move the object to the advantage of the director! In a film which has separate scenes with time gaps, you can do whatever you want. Working this way was a bit of a puzzle, so we rehearsed and established all of those things with the continuity person, who noted everything. We shot the scenes in order, so we knew we could live with this technique, but that was important for Tonino, because throughout the rehearsals we had to establish what kind of light we were going to have. Whatever the actors did had to be respected.

I suppose you could say the same thing for your first feature, *Knife in the Water*, which took place almost entirely on a small boat.

Polanski: Yes, but in *Knife in the Water* we had a few time gaps. In this film, we had several minimal gaps, but practically none. When we established a light source, it had to be used throughout the film. It posed great problems for Tonino, because if I moved the actors to the other side of the room, there might not be a light source over there. And we did want to see our sources in the shot, because otherwise the shot would look ugly.

How involved do you get with the lighting?

Polanski: I only get involved if something doesn't look right to me. Then I tell the cinematographer. Other than that, he just does his thing. Sometimes after I worked out a scene on this film, Tonino would tell me, "If you do it this way, the light will be flat," so I would change [the blocking]. We couldn't change the lamps, so we had to move the people. Or we might move the camera position so that our main source wasn't behind the camera.

You've had experience in many aspects of film production, which makes you a jack-of-all-trades on the set. How does this affect your dealings with the crew?

Polanski: Well, you speak the same language, and they sense that you know what you're talking about, and you're not just faking it. They respect that, and they enjoying talking about technical stuff with me. I know all aspects of filmmaking not only from film school, but simply because I was crazy about movies when I was a child. They taught me how to make blow-ups at school, but I'd been doing that long before I took any classes. Knowing what you're talking about is to your advantage when

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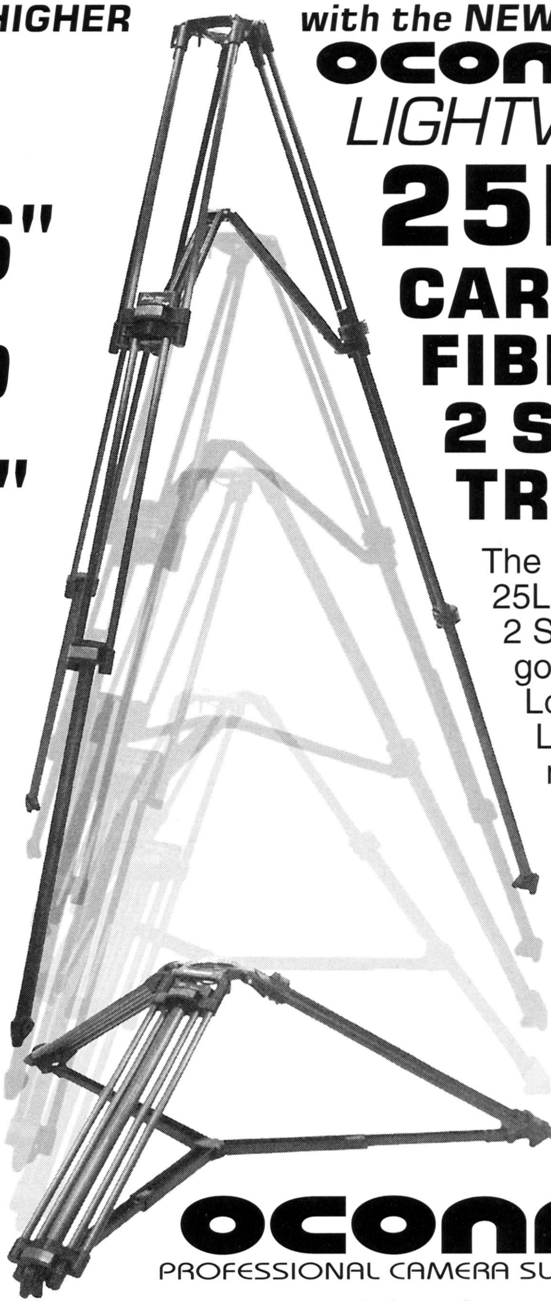

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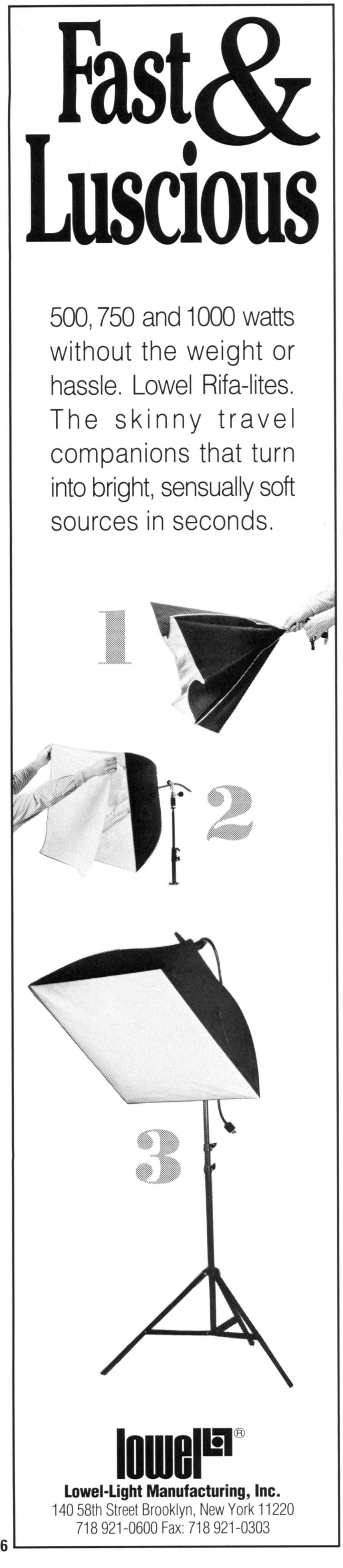
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you're dealing with people who are very technical.

Like Hitchcock and Kubrick, you're noted for being a very thorough planner in preproduction. But do you try to balance that kind of control with a degree of spontaneity on the set?

Polanski: Spontaneity lies within the actors' contribution. Actually, I never use storyboards, except for special effects scenes or scenes that require specific and accurate preparation of the technical unit. But for scenes where those elements are not required, I give the actors total freedom. I never place the camera before the rehearsals. I rehearse with the actors and observe them and let them carry me through a scene. If it feels wrong, artificial, or untrue, then I try to find the reason and shape the scene until it's totally acceptable. I never tell them "Do this," "Sit here," or "Go to the right." If an actor asks me, "How do you want me to sit?" I say, "Sit any way you want." Sometimes, if the actors don't know me that well, they take it as incompetence. So much the better! This way allows them to sit as they instinctively would.

How does your experience as an actor affect your direction of other performers?

Polanski: First of all, I understand their problems. But I also understand their bullshit. Sometimes they try to tell me things that are not so, but I never buy it. I have sympathy for actors who do it for real; others just try to fake their way through.

Your films always have a creeping sense of inexorability, which heightens the suspense. What did you do technically on this film — in terms of lighting, composition and lenses — to heighten the suspense?

Polanski: I didn't think of heightening the suspense through technical means. I did think that having three people waltzing around in this small room meant that I would need wide angles and great depth of focus so we could see all three of them clearly.

Did you have a favorite lens on this shoot?

Polanski: We worked at 21mm quite a bit. We used the Panafocal variable-focus zoom, which varies from 18mm to 23mm. On average, it was 21, but very often, I changed the focus throughout the shot.

Were you doing anything specific with your framing?

Polanski: Those things are instinctive. I don't have any scheme. I just feel things in a certain way, and place the actors accordingly. As I said, I let the actors do more or less what they want, but then I adjust things a little bit. I might have them move a bit to the left or right, but then I set up the camera and make it move the way I would move if I were an invisible observer of this action. I would be walking around, turning my head, moving my eyes. I try to do this with the camera; it's quite simple, in fact.

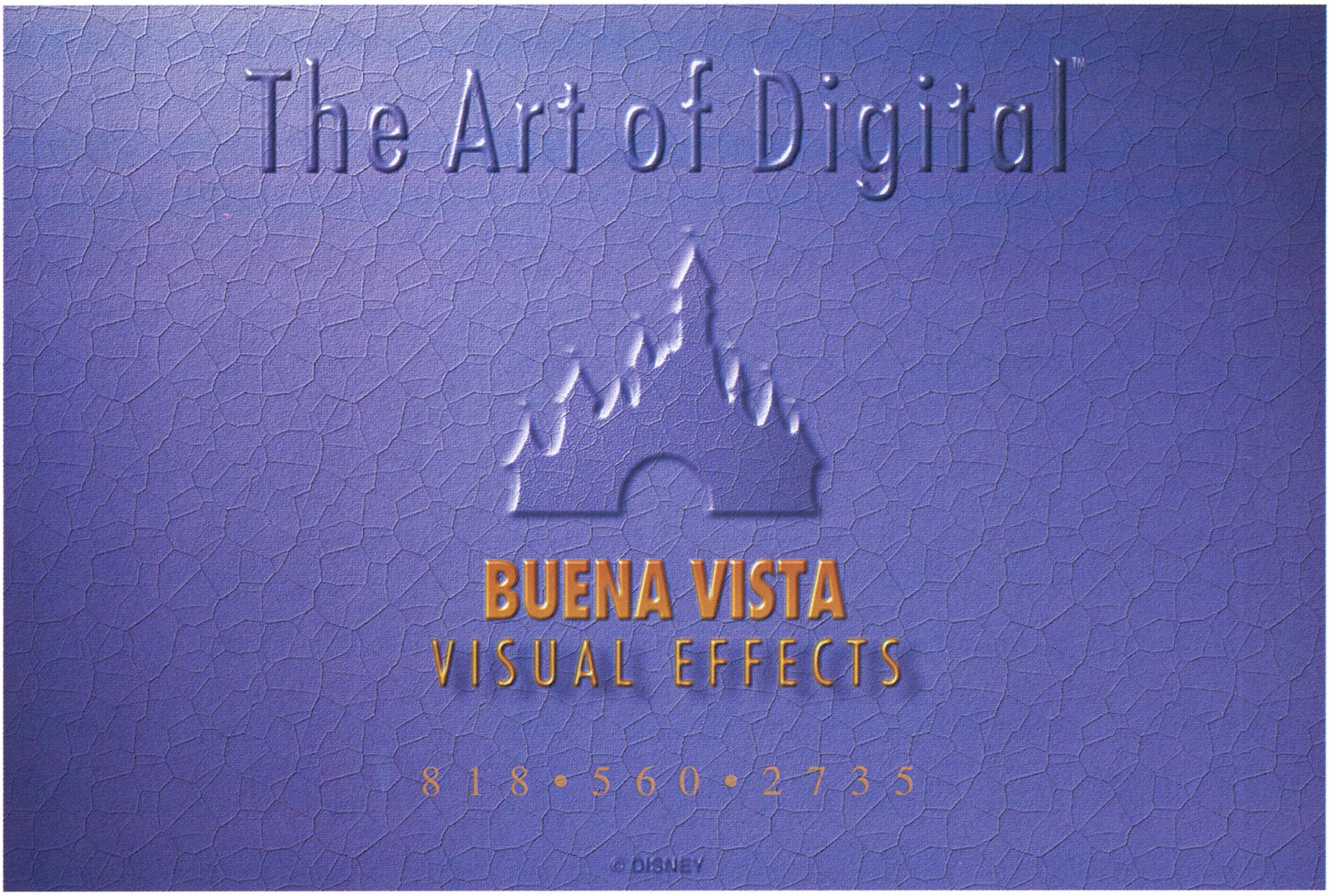
You've used such subjective techniques in many of your other movies as well, to place the viewer in a voyeuristic position. Do you feel that such an approach is the essence of moviemaking?

Polanski: Well, it depends upon the subject. If you have a more epic situation, like in *Tess,* you don't necessarily want to use these techniques.

You tend to favor realism, especially when it comes to portraying violence. Do you feel that realism is more effective than a stylized approach?

Polanski: No, I just feel that the audience has to believe the scenes that they are watching. If there is no realism, you lose them. The more unbelievable the story is, the more realistic the presentation must be.

In this film, Ben Kingsley's character is "delivered" to Sigourney Weaver's by sheer chance. In many of your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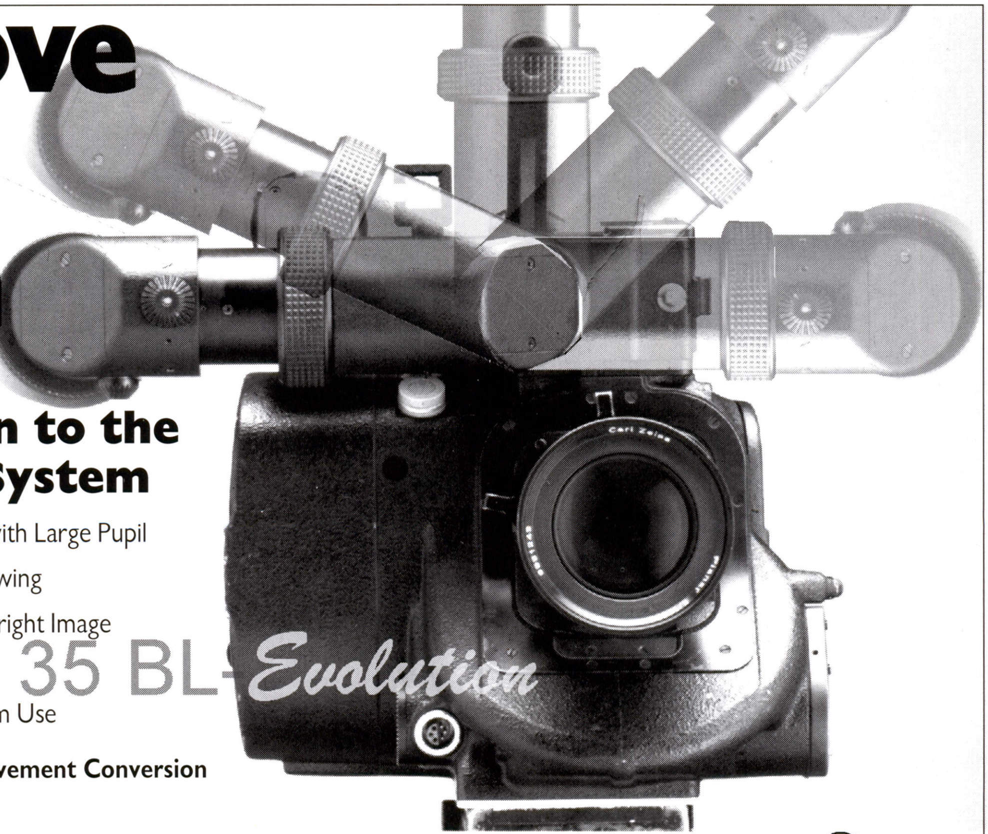
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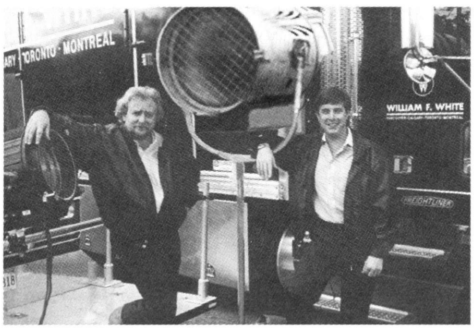

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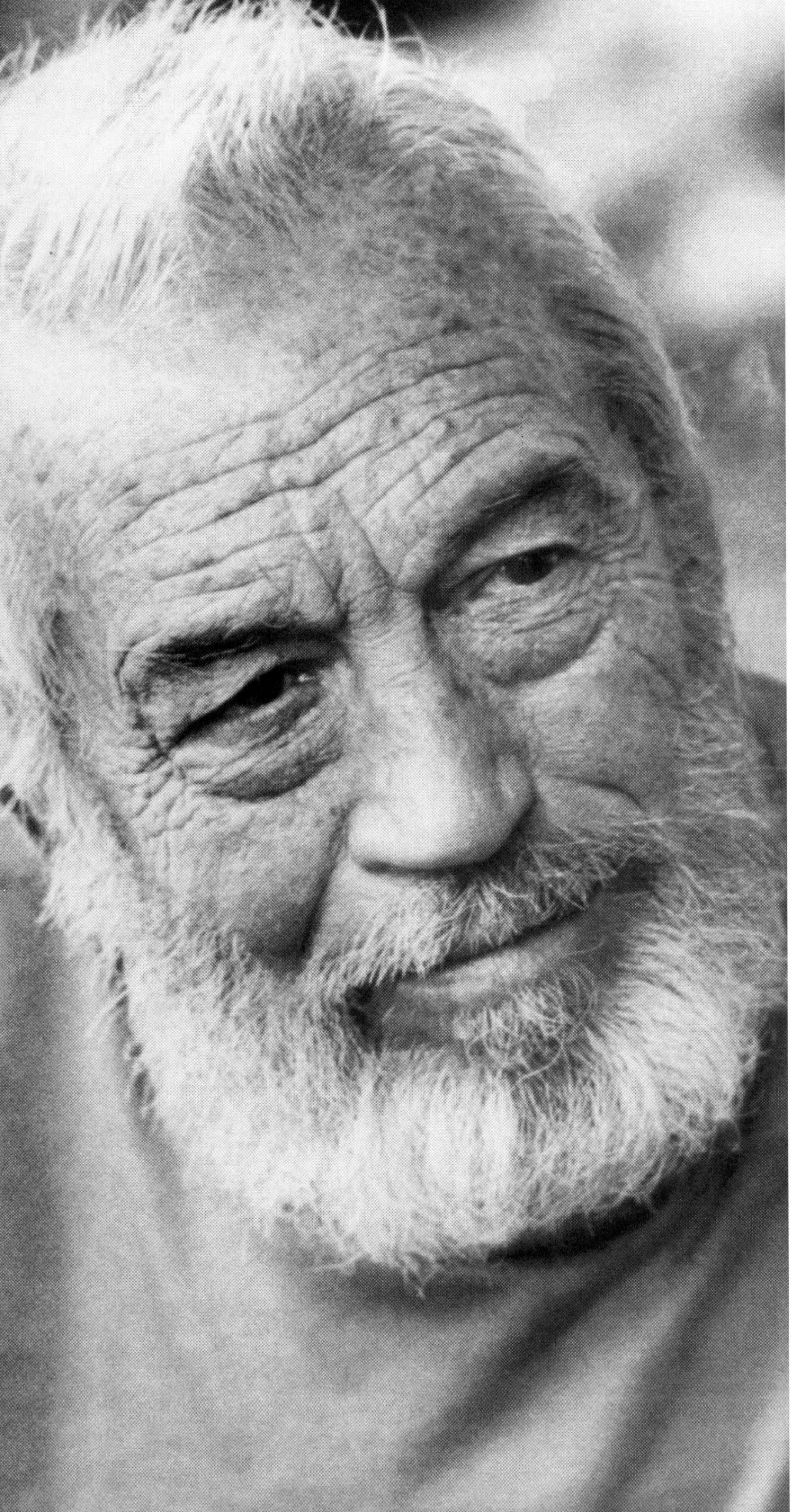
movies, however, people are forced into confrontations by fate. What are your feelings on the subject of fate vs. chance?

Polanski: I think fate is an extremely interesting element, not only in movies, but also in literature. But in this film, Ben Kingsley's arrival is not really a question of fate. I actually never really liked the way he appeared so miraculously in the play; I think it's too much of a coincidence. In *Tess,* for example, the heroine's father meets the preacher on the road who tells him of his novel origins. That's fate; had he passed the crossroad a minute later, Tess would not have had all of her problems. Later in the film, when she slides the letter under the door and it winds up under the carpet, never to be read, that's fate. It helps determine her tragic future. To me, the situation in *Death and the Maiden* is a bit convenient, but there would be no play if Miranda didn't turn up! I just left it the way it was, because it was one of the basic elements of the structure of this particular piece.

You've often been described as a "pessimistic" director. Do you agree with this characterization?

Polanski: I think that's a very superficial analysis of what I do and who I am. The fact that you don't end a film with a forced happy ending doesn't mean that you're not an optimist. If you show tragic events, they have to have a tragic ending. That's the definition of a drama; it has to end in tragedy in order to have an impact on the viewer. If you show a bunch of people who do evil, and at the end they're all wonderfully punished, it leads you to believe there's nothing to be done anymore, because someone is taking care of it for you. I prefer to leave the responsibility with the viewer.

In the past, you've done a few "revisionist" films that subvert the traditions of various genres. Do you have any plans to do such a film in the near fu-



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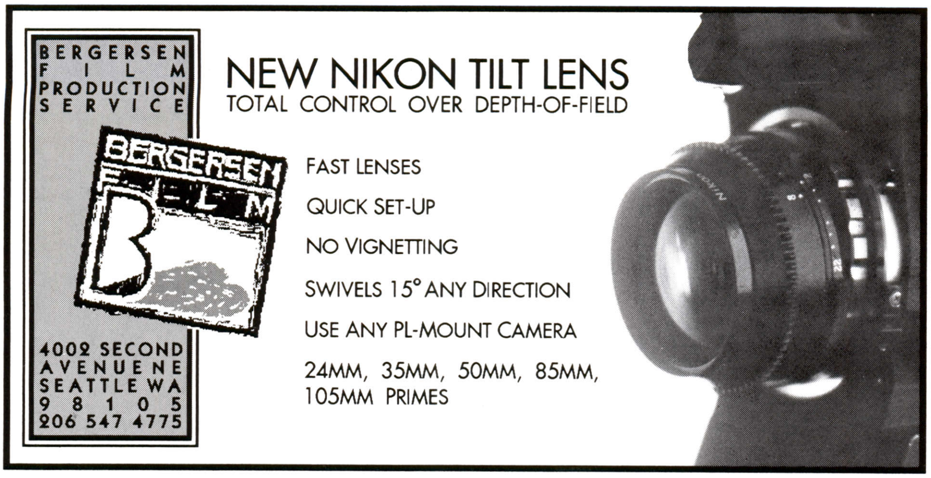
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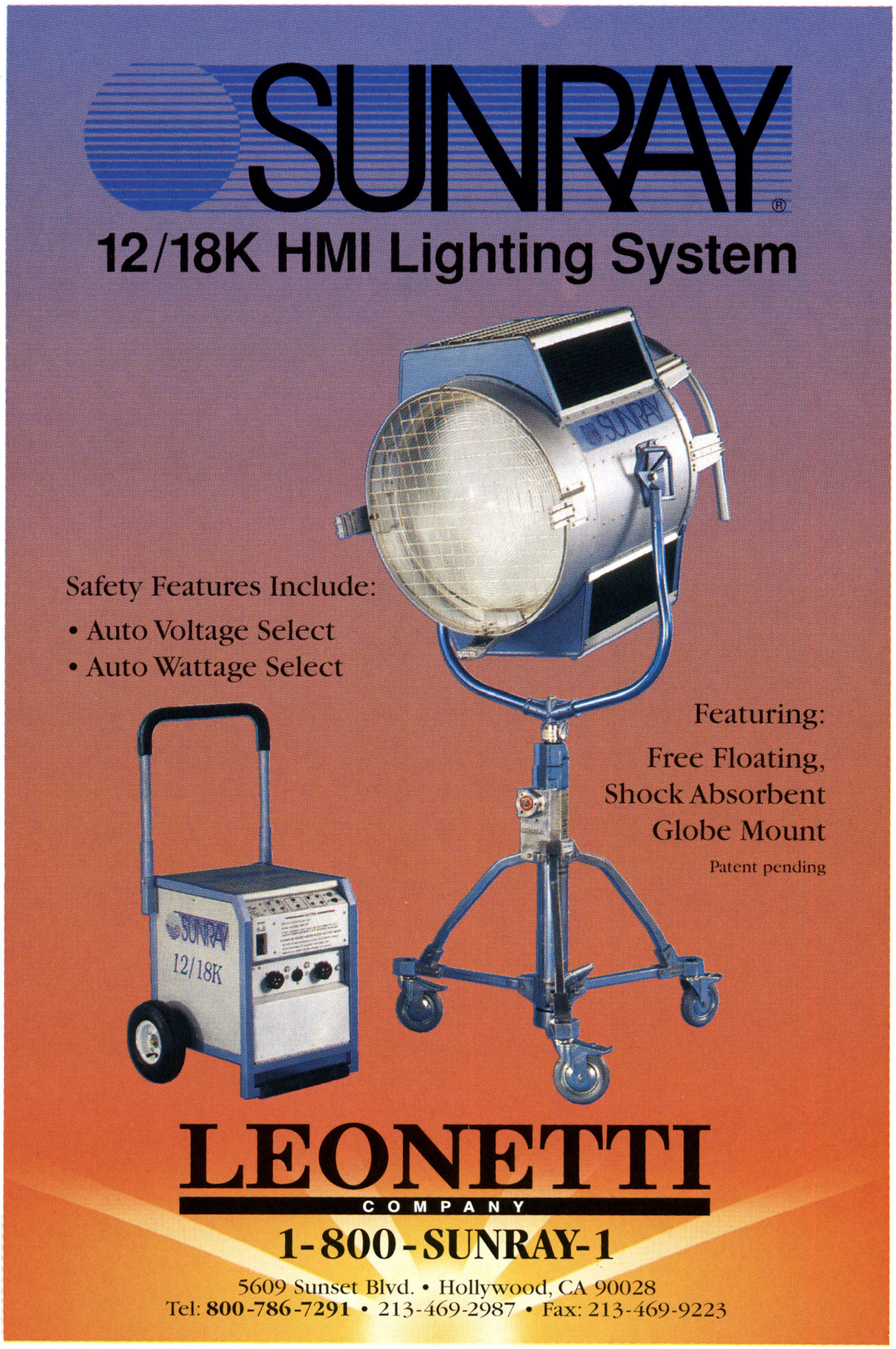
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ture? You seem to enjoy putting ironic twists on well-know genres.

Polanski: I love it! I did that in *Chinatown, Rosemary's Baby* and *The Fearless Vampire Killers*. I like movies, so obviously I would like to tackle every genre. I would love to do a musical or a Western someday.

From a director's perspective, what are some of the major differences between making a film in Europe and the U.S.?

Polanski: In the United States, filmmaking is more industry-driven. Here, it's more artisan-like. You benefit here from the involvement a bit more than in the United States. On the other hand, the American system is better organized and better run. It's a very complex and heavy machine in America, but if you know how to run the machine, you can probably get greater mileage. What it lacks is the personal involvement of all the technicians that I can get here. It's like a family on the set. The atmosphere can sometimes be extremely exciting.

Given your personal circumstances, is there any possibility you may someday work again in the U.S.?

Polanski: I don't know. At this time, there is no change in my situation. Perhaps one day it may happen. I would very much like to do another film in the States.

What are your plans for the immediate future? I've heard a rumor that you were interested in directing *Wartime Lies*, a World War II project to which Kubrick had briefly been attached.

Polanski: No, I'm not going to do that project. It's a subject I'd like to get involved in someday, because I feel that I should make a film in Poland sooner or later. I have several ideas, and I'm considering many projects which are not concrete enough to be announced yet.

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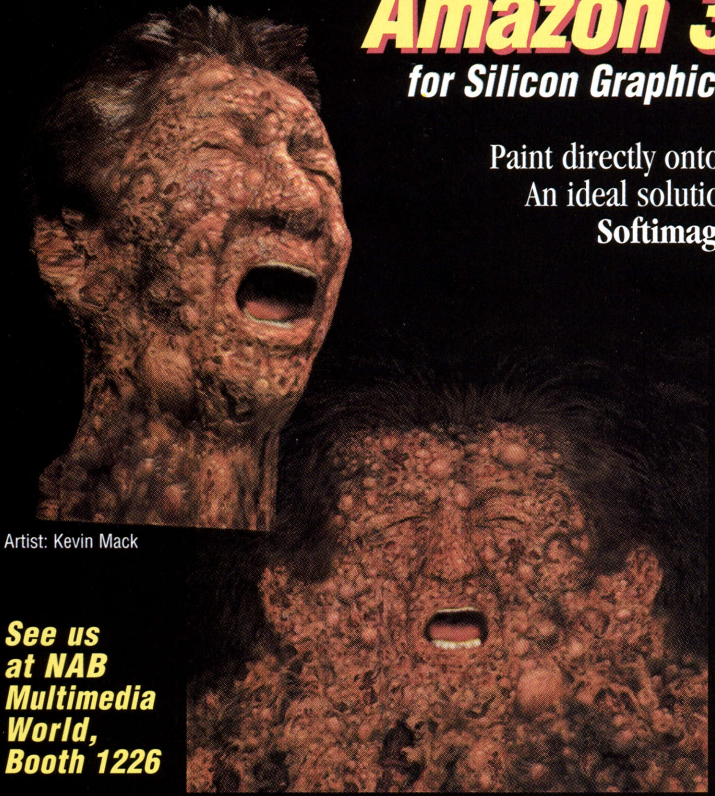

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Personality Prevails in *Killing Zoe*

Creating Paris in Los Angeles requires imagination and innovation.

by Al Harrell

Movies pumped up on testosterone and nihilistic excess, like Quentin Tarentino's *Reservoir Dogs*, have become the calling card for an emerging group of young independent filmmakers. It is a calling card that almost guarantees entry into the world of mainstream Hollywood filmmaking.

Roger Avary's debut feature, *Killing Zoe,* is just such a picture. But instead of being printed in broad, blood-splattered flourishes, it is embossed with visual style, quirky performances, throwaway humor, and a surprising degree of character and visual subtlety.

Avary's low-budget "caper-gone-bad movie," shot by Tom Richmond (*Stand and Deliver, I'm Gonna Get You Sucka* and *A Midnight Clear*), is a deft mix of a few days of footage shot on Paris streets, savvy camera work, and production design that turns Long Beach and downtown Los Angeles locations into a gritty Parisian landscape. This landscape is populated by an international band of thieves led by a sociopath infected with HIV; a French woman who studies art by day and is a hooker by night; and a cynical American safecracker with a past straight out of *Casablanca*.

This quirky tale initially put off director of photography Richmond; he admits that at first, "I didn't quite get the script." He says that director Avary "hooked me in two ways: first, he had a laserdisc of *The Chocolate Wars*, an obscure movie I had shot; then he said that he wanted the bank in *Killing Zoe* to be like the Overlook Hotel in *The Shining*."

The Overlook was a huge maw of a hotel that seemed to swallow its inhabitants, gradually pulling them deeper into its bowels. The image clicked with Richmond. It was the perfect metaphor for the action of the *Killing Zoe*, and a clear definition of visual style.

"I studied photography and architecture at Harvard,"

Photos by Linda R. Chen, courtesy of October Films

Richmond says. "I've always been fascinated with the idea of cars and buildings having personalities. So, the idea of 'animating' the bank fascinated me."

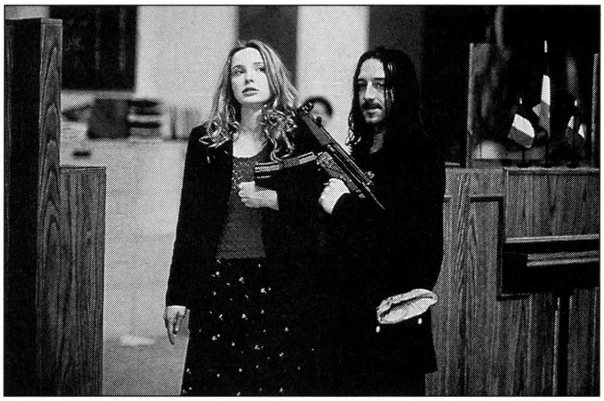
The bank sequences, in which all hell breaks loose, cap the movie. The images are a careful blend of Richmond's lighting strategy and production designer David Wasco's visual design of the location, a downtown Los Angeles building that stood in for a Parisian bank.

"When I read this script and it said Paris, I said, 'Oh, great, L.A. for Paris," Richmond says, his voice indicating that he wasn't sure the idea would work. "But it's designed like a play. It's a completely interior film, and what I love about it is that nothing in the story is sacrificed because it's shot in L.A. The people in the story are indoor, underground, nighttime people." In keeping with the "indoor, underground" feel of the people and their environment, Avary has Eric (Eric Stoltz), Zed (Jean-Hughes Anglade), and the international crew of would-be bank robbers go on a pre-heist night on the town that ends up in an underground nightclub.

Richmond photographed these sequences using a color scheme that depended on the controlled use of blues in the nightclub sequences and reds in the bank vault sequences, as well as an economical use of light. Avary says of Richmond's lighting strategy, "He doesn't light so much as he takes away light to make a scene work."

Richmond "takes away light" with the strategic placement of white cards and blacks. "Instead of lighting dramatically," Richmond says, "I would make light go away. I didn't use film noir lighting, but there were still shadows and shadings. This use of cards and blacks was partly for speed. We had a short shooting schedule and needed to get the lights up; we also needed to keep blue or red reflection from where I didn't want it."

An additional tool in Richmond's lighting and lens package that depended on this lack of light was the Clairmont Camera Company's "Swing and Tilt" bellows lens. These lenses very subtly place the audience inside the arc of the wild night before the heist, a night that begins in a drug rush and eases into an ominous alcoholic haze.



Opposite: *Realizing that his plan is falling apart, Zed (Jean-Hughes Anglade) rampages through the wrecked bank.* **This page:** *In the midst of the robbery, Zed renews his brief acquaintance with Zoe (Julie Delpy).*

"The idea was to create fascination and disorientation of the main character, Zed," Richmond says, "So, the camera is usually close and obsessed with something. Roger wanted to create the feeling of being on drugs. I'm always apprehensive about ideas like that, but the lenses helped get the effect."

The Swing and Tilt bellows lenses are usually used in still photography to correct distortion. Music video photographer Matt Maherne has used the lenses, as have the Coen brothers. Like Maherne, Richmond's impetus to use the lenses came from his still photography background.

"Still photography is like my home," Richmond says. "I remembered studying 4 x 5 still photography; the cameras have accordions on the front. What they're for is to either fix your perspective or to keep things in focus that wouldn't normally be in focus.

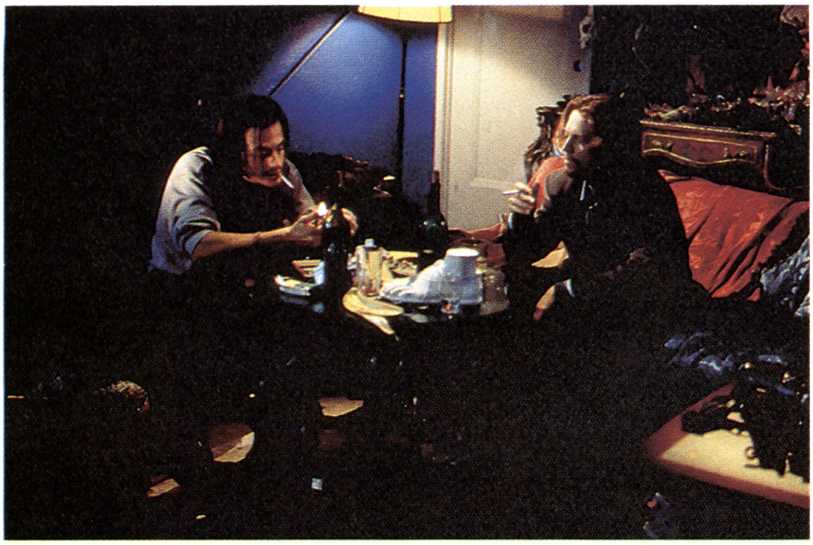
"Film is horizontal, which means it is closer to how we perceive the world," Richmond says, "The way we see is horizontal, not up and down. The Swing and Tilt lenses, along with the lack of light, closed off the horizontal. You lose your peripheral vision. People just seem to appear in frame."

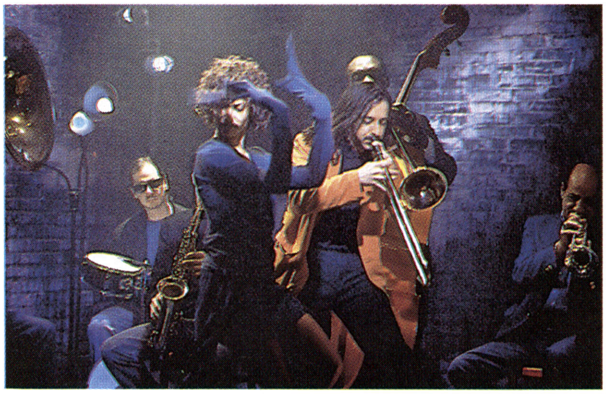
This effect could have been achieved with clever camera angles and split-second editing, but, as Richmond points out, "the actors were there but you couldn't see them because they're out of focus and in the dark." Also, both Richmond and director Avary wanted the immediacy of an in-camera effect that would maintain the integrity of the performances, and not make the performances secondary to visual choreography that called attention to itself.

"The Swing and Tilt lenses work really well viscerally," Richmond says. "It works in terms of disorienting without being gimmicky. What I loved about this idea was that it's all done in the camera. You shoot it. You don't do anything to the film afterwards."

Richmond says working with the lenses was one of the highlights of the shoot, despite some inherent speed problems. "I was really put on the spot to make the lenses work," Richmond is quick to say. "They're very hard to use. The camera assistant can't focus — the operator must. This terrified both the AC and me, since I was the operator. Also, the more you swing and tilt the lens, the more you start to lose your exposure. The dark club made it especially hard to tell if I had the exposure."

These sequences using the Swing and Tilt lenses were shot on 5296, as were all the additional interiors. Also these sequences, like a surprisingly large proportion of the film, were shot handheld. Richmond, as he does





Top: *Moody source lighting sets the tone for the criminals' pre-heist evening of debauchery. Here, the American safecracker (Eric Stoltz, at right) has a smoke with one of his French co-conspirators.* **Bottom:** *Cinematographer Richmond used a controlled palette of blues to lend a decadent feel to this raucous sequence in an underground Paris nightclub.*

for most films that he shoots, served as his own camera operator.

"Prior to this film I had done very little handheld photography. But, once I saw Jean-Hughes Anglade's rehearsal performance upstairs in the bank, I took a big, deep breath and told the director I could follow him all around the room handheld, and that this method might be better for the actor," Richmond says. "I told him to let them go."

"I started shooting the scene and I learned a whole new part of myself," Richmond says. "I'm very dramatically oriented. I love the visual work, but I get sucked in by stories. So, by going handheld, I was actually able to interpret and make some of my own decisions instantly; and the actors started to respond. It allowed me to participate in a new way with the actors."

Richmond believes that operating the camera himself only adds to the actors' comfort level with the script, director, and cinematographer. "When I operate, there's a very valuable interplay between me, the director, and the actor. So, if you add an operator, I think you add another formal element that serves as a distraction," Richmond says.

Richmond didn't use a Steadicam for the handheld sequences he shot, but instead created a rig that was simple and effective. "I had a climbing harness around my waist, and a bungee cord wrapped over the back of the camera. The cord pulled the camera backwards," Richmond says. "Mainly, this stopped the camera from falling over when you tilted down."

The rig is testament to Richmond's background in low-budget films and still photography. It is a background that includes a stint at UCLA's film school, where Richmond worked with innovative filmmakers like Alex Cox (director and writer of *Sid and Nancy* and *Repo Man*) and Michael Minor (screenwriter of *Robocop*), who, as Richmond says, "were dead set on being in the film industry."

This background, where innovation and determination are stand-ins for time and money, worked especially well when shooting in difficult locations. One such location, a penthouse apartment in Long Beach, filled in for the Parisian headquarters of Eric's gang. The penthouse apartment had no freight elevator; the electrical cable was run down the side of the eighteen-story building, and only a limited amount of lighting instruments were allowed in the space.

Richmond explains why he felt this location was necessary, even though it presented difficulties for his lighting and grip crew: "Roger and I fought everyone to use that location, even though it was the most impractical place to shoot in. The reason that we were adamant about the location is because the film doesn't rely on a lot of the normal dramatic devices to hook you into the movie. It relies a lot on performances and a kind of delicate edge of crazy versus charismatic versus funny."

Both Avary and Richmond were determined to make the space work. "We lit the upstairs very simply," Richmond says, and it was in these scenes that he introduced the blue color scheme that would be carried over into the nightclub sequences. Careful attention was also paid to the staging and framing of the scenes in order to allow the performances to happen and to get across plot points — one important plot point being that the heist is very poorly planned and everyone is too jazzed on the idea of a heist to realize it. It is a plot point that pays off in a deadly way later in the film.

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with innovative filmmakers like Alex Cox (director and writer of *Sid and Nancy* and *Repo Man*) and Michael Minor (screenwriter of *Robocop*), who, as Richmond says, "were dead set on being in the film industry."

This background, where innovation and determination are stand-ins for time and money, worked especially well when shooting in difficult locations and making them work. One such location, a penthouse apartment in Long Beach, filled in for the Parisian headquarters of Eric's gang. The penthouse apartment had no freight elevator, the electrical cable was run down the side of the eighteen-story building, and only a limited amount of lighting instruments were allowed in the space.

Richmond explains why he felt this location was necessary, even though it presented difficulties for his lighting and grip crew: "Roger and I fought everyone to use that location, even though it was the most impractical place to shoot in. The reason that we were adamant about the location is because the film doesn't rely on a lot of the normal dramatic devices to hook you into the movie. It relies a lot on performances and a kind of delicate edge of crazy versus charismatic versus funny.

"We went into that place and felt it was real. So, the actors wouldn't have to act in there; all they'd have to do is become the character."

Although the location worked for the actors and the director, the assistant director and producer were skeptical about the location working logistically — the ability to move the camera was limited and there were restrictions on the type and quantity of lighting instruments allowed into the space; all this was coupled with a tight shooting schedule.

Both Avary and Richmond were determined to make the space work. "We lit the upstairs very simply," Richmond says, and it was in these scenes that he introduced the blue color scheme that would be carried over into the nightclub sequences. Careful attention was also paid to the staging and framing of the scenes in order to allow the performances to happen and to get across plot points — one important plot point being that the heist is very poorly planned and everyone is too jazzed on the idea of a heist to realize it. It is a plot point that pays off in a deadly way later in the film.

The locations in *Killing Zoe* had to sell the idea that the movie was set in Paris. One such location, the Parisian hotel where Stoltz's character meets art student/hooker Zoe (Julie Delpy) while waiting for Zed, is a prime example. "The selection of this hotel was one of the reasons I liked Roger," says Richmond, even though he shoot on the sixth floor of the hotel in a small, visually spare room.

Normally, an audience equates a Parisian hotel with high, vaulted ceilings, intricate wood work, and an old world luxuriousness. "Our location manager found a few of those," Richmond says; however, Avary, who had been to Paris a few times, was after something else entirely. He selected the Mondrian Hotel on Sunset Boulevard as the location for these scenes.

"Roger felt it looked exactly like a modern hotel in Paris, so I went with this stark, formal room," says Richmond. The grey, starkly lit room is as noncommittal as the characters and as anonymous as the sex that takes place there, in the blue-white light from a television set broadcasting Murnau's *Nosferatu*; the room then becomes a pressure cooker for Zed's quiet rage when he comes for Stolz's Eric and, with a brutal casualness, tosses the half-naked Zoe out into the hall. These sequences are lit with hard light, making the scenes very immediate and present, while maintaining a neutrality.

Allowing each location to comment on the action and the characters involved a great deal of cooperation between Richmond and production designer David Wasco. The success of this joint effort is evident in the bank sequences that close the movie.

The bank sequences had a specific color scheme: as the characters move deeper into the vault and closer to their goal, they move deeper into a situation that will eventually swallow them whole, and red becomes the dominant color.

"The top floor is like a bank, but the deeper down you go, the redder and smaller it gets and the more constricted little canals you go into, until the basement of the bank is bright red," Richmond says, "It makes no sense that the basement of a bank is red, but it works for the scenes."

Richmond didn't use red gels, but bounced white light off the red walls or red, pink, or brown cards. "I wasn't trying to cut the light or make shadows, so there was quit a bit of light even with the red.

Richmond discovered something interesting in working with the red color scheme. "Red is a difficult color for photography," Richmond says, "but red light photographs very well. I exposed more for the color scheme than the people, and then adapted the people to that."

The lighting of the upstairs of the bank is an example of this approach; Richmond wanted to avoid a look that was too "sourcy," and he also had to get 10 shots per half hour because of the short shooting schedule. So the lighting scheme had to be logistically economical while still remaining true to the dynamic.

To achieve this double duty, Richmond's lighting crew placed HMIs on the balcony and pointed the units at the Renaissance Murals on the walls. 12K units and par lights were also bounced off the walls. "I used mostly fluorescent and flat, bounced, soft light," Richmond says, "which isn't the way you normally go with a scary or dramatic film."

The bounced light took on the color temperature of the murals, creating a comfort zone that, according to Richmond, suggested, "If you could get back upstairs from the vault, you just might survive."

One of the most interesting aspects of Richmond's work on *Killing Zoe* is the premium he places on making his camera work complement the actor's performance. If there is such a thing as an actor's director, then by the same token there is a "actor's cinematographer," and Tom Richmond is such a cinematographer.

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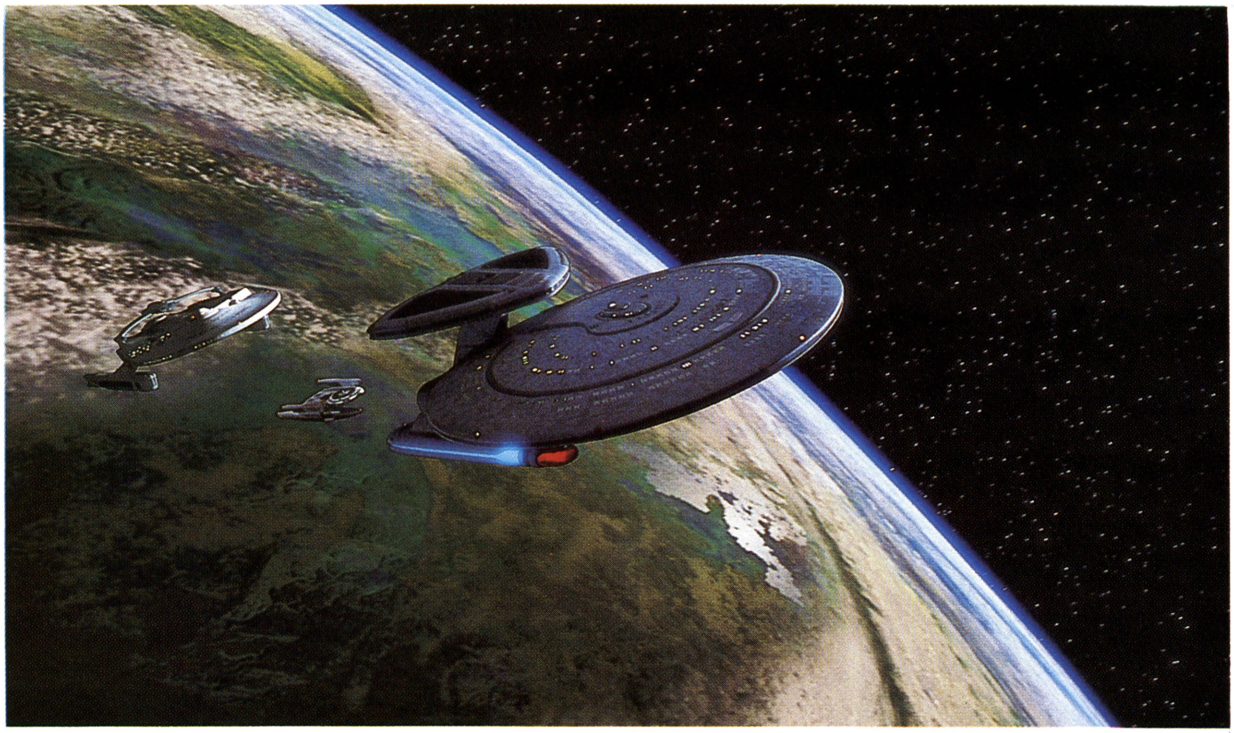

Photos by Sean Casey, courtesy of Industrial Light & Magic

ILM Creates New Universe of Effects for *Star Trek: Generations*

As film series' old cast gives way to new, traditional effects are combined with latest digital techniques.

by Ron Magid

The remarkable effects for the classic Sixties *Star Trek* TV series were state-of-the-art for their day, magnificent imagery that weekly pushed the limits of what audiences could expect from that square invader that had taken over their living rooms. Effects pioneers like Linwood Dunn, ASC — whose credits include shooting the famed RKO Radio logo, compositing *King Kong*'s timeless imagery and creating the Acme-Dunn Optical Printer, the workhorse of special effects creation since the Thirties — brought formidable talents to the fledgling sci-fi television series. In fact, the *Enterprise*'s famed numerical designation, 1701, was Dunn's street address.

Since *Star Trek* preceded *Star Wars'* computerized motion-control revolution by more than a decade, virtually all of the show's effects involved locked-off matte paintings and miniature shots, a failing that was ultimately remedied in six motion pictures that took the *Enterprise* to the limits of motion-control technology. Most recently, for the seventh installment in the *Star Trek* filmic series, a new generation of artists has taken the classic *Trek Enterprise B* and the *Next Generation's Enterprise D* into the digital realm.

But there was more to the decision than just concern for the traditions of *Star Trek*. Knowing what kind of return each of the *Trek* films has made in the past, Paramount believes, enables the studio to predict what *Trek* films will make in the future. Consequently, before a script is even written, every item needed to make the film is tightly budgeted, including visual effects. "Of course, *Generations'* screenwriters did exactly what you'd expect them to do," says visual effects supervisor John Knoll, who was finishing up *Baby's Day Out* as *Star Trek VII* was gearing up. "They went way beyond the bounds of television and did something much more cinematic, so the script was jammed full of really cool, expensive effects. Then we went through this incredibly painful process of storyboarding the effects, without minding the budget, to best serve the script. Even after we figured ways to execute the expensive shots more cheaply, it was still more than they wanted to spend. That's when we really started hacking into it, which was the most painful part: we had all the storyboards up on the wall, the bare minimum number of shots to tell the story, with nothing left to cut, and we still had to cut stuff out. We found some sneaky ways to keep a couple of effects in there, like combining shots, but it was tough."

Under the circumstances, ILM had anticipated using traditional motion-control spaceship miniature effects primarily, and in fact, many of *Star Trek Generation's* space shots, including the climactic space battle over Veridian 3, were handled that way. Visual effects supervisor Knoll led the model revamp, virtually re-building the Spacedock miniature — unused since *Star Trek - The Motion Picture* (it was shown in stock shots in *Star Trek II*). The model required a major refit since it was built to house *Enterprise A,* but this time it would garage the *Enterprise B;* Knoll squeezed the Spacedock down by removing its middle row of lights, giving it a more pleasing Panavision shape that fit much better into the anamorphic frame.

Meanwhile, model supervisor John Goodson had begun retrofitting the *Excelsior* model, originally built for *Star Trek III*, to serve as the newly launched *Enterprise B*. Alongside him was visual effects art director Bill George, who has enjoyed an ever-larger role in the cinematic saga of the starship *Enterprise,* having worked on five of the seven films. Their task, as George saw it, was to make the *Trek* films' Excelsior-class *Enterprise B* look as if its design was actually moving in the direction of the *Next Generation's Enterprise D*.

The team then set to work refurbishing the true star of any *Next Generation* movie: the six-foot *Enterprise D* model. During his modelmaking days at ILM, George had worked on that particular miniature for the *Next Generation* pilot; now it was his responsibility to renovate the *Enterprise D* model, which had languished in a crate since the TV show's second season. Ironically, while building that model seven years ago, he had been less than thrilled with the design. "I have to admit, when I first saw the *Next Generation*'s *Enterprise,* I didn't like it much, but it has definitely grown on me. I view most of the *Star Trek* ships as Art Deco — they're very simple shapes put together — but I think the *Next Generation* ship is more Art Nouveau. Quite frankly, it was a very difficult model to build because of that. It's definitely the next stage, and it's more organic."

While the *Enterprise D* was being prepped for its up-close-and-personal big-screen debut, George tried to convince producer Rick Berman to let him make some wee improvements. "There are some things I've always wanted to do to that *Enterprise,*" George laughs, "but Rick Berman just wanted us to give it a facelift. I wanted to change the paint job, because we didn't have a lot of time to paint it when we built the model back in 1987, and the green and blue color scheme didn't read on television. Rick agreed, since the six-foot model was pretty beat up. We stripped off all the paint and decals and bondoed all the dents and scrapes where the motion-control camera had run into it. We took the color more toward a battleship grey, and also, per John Knoll, added some glossy areas because he liked the tiled look of the original movie *Enterprise*. When there's raking light across it, you can see that panelled look and it's really beautiful."

Visual effects supervisor

Opposite page: ***A Federation caravan heads into space.*** **This page:** ***The Klingon Bird of Prey and the Enterprise D lock horns over Veridian 3.***

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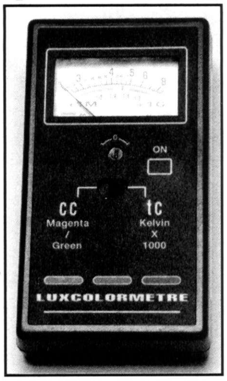

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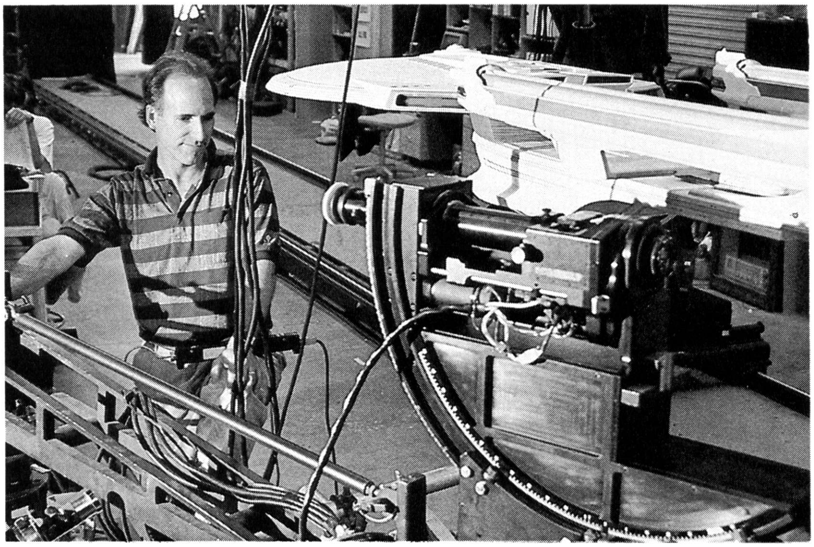

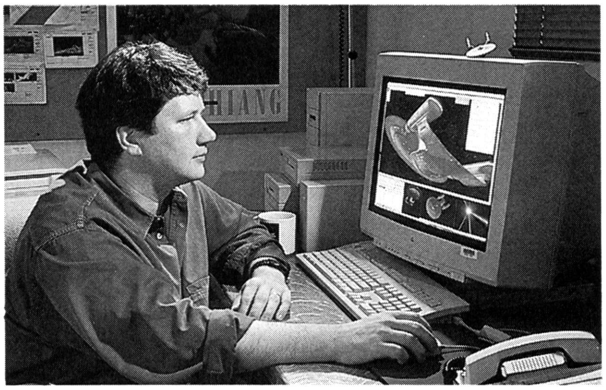

Above: ***Motion-control camera operator Pat Sweeney, with model of spacecraft.*** **Left:** ***Visual effects supervisor John Knoll at the keyboard.***

John Knoll worked with George to devise optimum shots of the *Enterprise D,* or to do the obvious shots better than they'd been done in the past. A simple description in the script, such as, "The *Enterprise* orbits Veridian 3," gave George and other *Trek* fans at ILM the chance to create a classic movie moment with the TV icon. "I always get a lump in my throat when I see that shot because it's the classic orbiting-the-planet shot: we're looking at the *Enterprise* from underneath as it arcs majestically past the planet and there's a little bit of a lens flare as it passes in front of the sun. You wouldn't actually see the ship arcing around the planet, but we cheated. I think that's really the most beautiful shot of the *Enterprise.*"

While the space battle over Veridian 3 between the *Enterprise D* and the Klingon Bird of Prey was handled primarily using motion control, the budget didn't allow for breakaway models and pyro explosions, so the impacts were done with CG and traditional compositing tricks, including flashes of light, the CG equivalent of the old burning steel wool trick on "charred" areas and flying CG debris. At the climax of the battle over Veridian 3, the *Enterprise D* attacks a weak spot in the Bird of Prey, blasting it out of the stars. Figuring there was no way to improve on perfection, Knoll conserved his budget by re-using the climactic destruction of the Bird of Prey from the end of *Star Trek VI.*

But something unusual was happening on this *Trek* — computer graphics were making more and more inroads into a series that had been first a pioneer, then a bastion, of traditional effects. Even the weaponry of *Star Trek* was making the blazing transition into computer graphics. "The Bird of Prey's disrupters, those short little energy bolts, were hand-animated by Don Butler," Knoll says. "The *Enterprise*'s phasers were done more or less the same way, but with a little more complexity; we had some animation flashing through the beams. But the effect I was most excited about doing in CG was the photon torpedoes. I liked them best in *Star Trek - The Motion Picture*, where they had these big, bright, impressive shards of light; they looked as if they really had a lot of power, but the effect was hard to shoot. Apogee, John Dykstra's former effects house, created the effect by shining a laser beam through a clear crystal that they shot in smoke, which looked beautiful but was really tedious to do. I was unhappy with the way the photon torpedoes looked on the last couple shows, where it was always done using some kind of animation effect. So on this film, we decided to digitally simulate our photon torpedoes using computer graphics, and since the look was wide open, I opted to go back to the look of the first film. I actually just digitized some pieces out of *The Motion Picture* and used those as reference, then I wrote a simulator program that generated a photon torpedo that looked like the ones in *The Motion Picture*, and we animated it going from any point to any point."

But weaponry was only the beginning of ILM's computer graphics work for *Generations*. ILM had been asked to devise the most complex effect of the entire *Star Trek* filmic odyssey for *Generations;* in the process, they were about to transform *Trek's* effects forever. *Generations'* director, David Carson, described the Energy Ribbon — a massive space phenomenon that circles the galaxy every 20 years — as the true villain of the film, more so than the twisted and driven Dr. Soran, who wants to access the Nexus within the Energy Ribbon at any cost. "When this thing shows up, you know something bad's going to happen," art director Bill George grins. "We were charged

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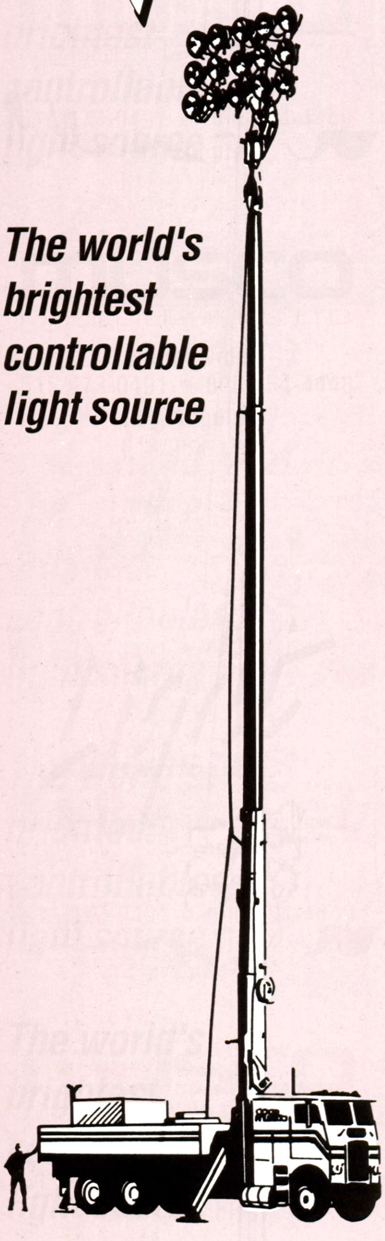

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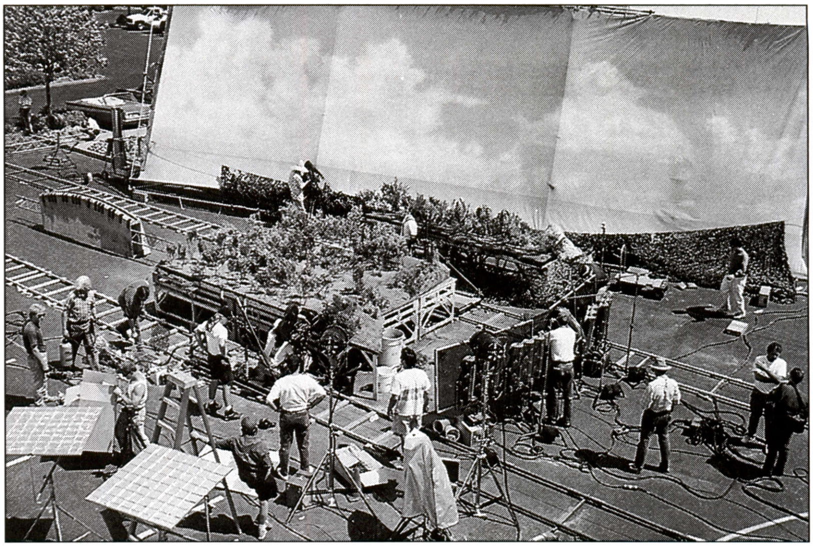


Above: ***The crew sets up for a dolly shot of a "forest" and "sky."*** **Left:** ***The hull of the enterprise is about to be hauled to its destruction.***

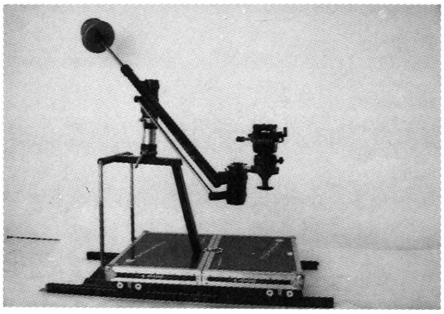
with giving the Energy Ribbon personality. We wanted to design something that had an architecture to it, that wasn't just a big glowing thing. An awful lot of thought and research went into it."

Carson was essentially asking ILM to create something out of nothing, one of the toughest orders in effects. Visual effects supervisor John Knoll had very definite ideas about the look and behavior of the Energy Ribbon. He saw the phenomenon as an actual rip between two different universes, a painful tear filled with volatile energy: "The image I had in my head was based on a JPL simulation of equipotential magnetic field lines whipping around Uranus. We had already designed the basic ribbon core, which was airfoil-shaped in cross-section as it trails off, but I thought it would be cool to add these magnetic energy tendrils radiating off the core that changed polarity as they grew towards the front. That idea in practice turned out to be a little too smooth and intellectual. The director wanted something that was more unpredictable, so we pushed it towards the electrical direction."

Fortunately, another of Knoll's ILM associates, visual effects co-supervisor Alex Seiden, had a lot of experience with creating outer-space phenomena on a vast scale. As a technical director on *Trek VI,* Seiden played a key role in creating a dramatic planetary explosion and shock wave for the film's opening. As he and Bill George tossed Energy Ribbon concepts back and forth, Seiden realized that they literally faced Infinite Diversity in Infinite Combinations, and fought to avoid hitting too many dead ends. "I actually rendered some things on the computer based on textures Bill painted for me, then I threw them back at him," Seiden recalls. "When creating something from scratch, it's always important to rough out the whole thing, then do the details. Because there are so many paths you can explore, it's easy to get bogged down finessing one little thing while everything else gets lost. In the end we came up with something that had the feel of John's magnetic field, but via a different mechanism."

After much trial and error, visual effects supervisor Knoll, visual effects co-supervisor Alex Seiden and George arrived at an undulating ribbon surrounded by a plasma energy field. "The scale issue was a bit touchy, however — in space you don't have any reference," George says. "It's not the blast of an atomic bomb but the trees falling over that creates the sense of that bomb's scale and power. We wanted to show that the Energy Ribbon was much bigger than a starship, but we didn't want to see one right next to it because of *Trek VI*. On that film, director Nicholas Meyer felt that the shockwave would look big if we made the starship really small. Unfortunately, that approach just made the ship look really dinky, which inspired one critic to call it the S.S. Plastic Thing! We decided to add scale by giving the Energy Ribbon a debris field of embers following behind it, the way mud trails behind the current in a clear stream. Alex Seiden programmed a model of this undulating ribbon in the computer, then added the airfoil shape and the tendrils and a variety of color variations. We transferred Alex's model to Photoshop, where we painted in a starfield and the debris trail. That enabled us to think the design out, see what was happening in perspective, then add color and detail."

Events occurring inside the Energy Ribbon required the most complex visual effects work. When the El'Aurian spacecraft Lakul and her sister ship become trapped within the phenomenon's magnetic field, it's less like being in outer space



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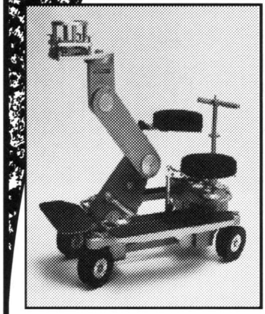

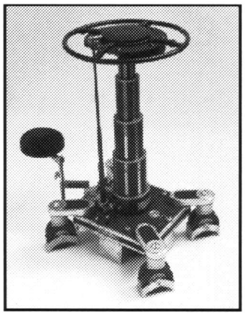

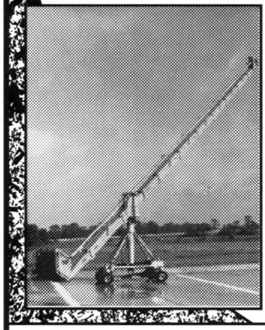

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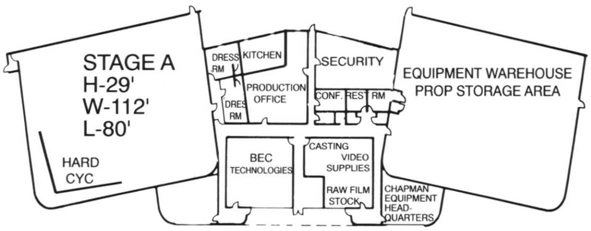

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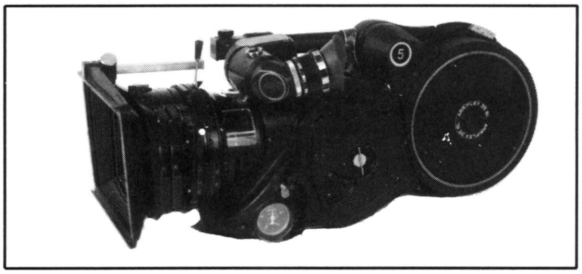

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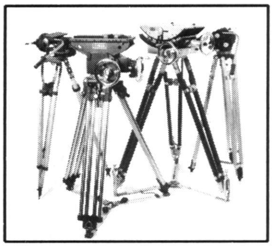

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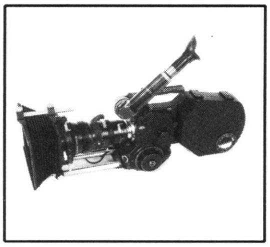

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and more like being inside of something alien, according to visual effects co-supervisor Seiden: "The Ribbon surrounds you like plasma, or a dense electrical storm, so you don't see a lot of deep space in the background. When we had explosions or energy discharges caused by the tendrils flailing, we flashed the entire frame a bit and simulated a fogging of the film. Doubtless in the 23rd or 24th Century we'll have much better anti-halation backing on the film, but for some reason they just didn't shoot with that for these shots!"

"The *Lakul* was actually based on a truck we had designed for *Back to the Future* that John Knoll liked," George reveals. "I really enjoyed working with Rob Coleman, who was our CG modeller. Designing the basic shape went pretty smoothly; it was a bit brick-shaped, but we added some pontoons to it, which helped a bit. But detailing it became a bit frustrating because I couldn't get my hands on it. Rather than trying to communicate which things should be changed, it was easier for me to make a quickie model the traditional way and set it on Rob's desk. I'd come back two hours later and his CG model would be perfect. I'm encouraged that computers haven't completely taken over. It's becoming obvious that the old and new tools work best together."

But destroying the *Lakul* and its sister ship in the computer was far harder than building them. Electric Image's Animation System for Power Macintosh, Version 2.1 was a tool applied to many of the CG shots. Knoll was able to do some of the design work at home, and later upgrade and composite it into the final. Version 2.1 imports, renders and animates objects from many modeling programs, making use of a range of controls at high resolutions.

ILM decided to build the *Lakul* and its sister ship using computer graphics in the first place, so that the alien vessel could move freely through the CG Energy Ribbon model. This method also helped the effects wizards overcome other effects nightmares, such as controlling the interactive light. Such challenges proved to be good arguments for digitizing the *Enterprise B* as it entered the intergalactic phenomenon — if Knoll and company dared to do it. After discussing it with Seiden and CG Supervisor Schlag, Knoll decided that the entire effects sequence, wherein the Enterprise B attempts a rescue of the *Lakul* within the Energy Ribbon, should be created in CG. "All the shots of the *Enterprise B* in the Ribbon were done with computer graphics," Knoll confirms. "The decision allowed us to have particles streaming around the *Enterprise* as though they were deflected by the shields, and to do effects with tighter interaction than we could've gotten away with using motion control."

But the *Enterprise B* was first and foremost a motion-control miniature. The big question was whether the CG and motion-control models would cut together seamlessly. To make sure they did, photographs of the actual *Enterprise B* motion-control miniature were used as templates to create the computer wireframe schematic — sort of a three-dimensional blueprint of the starship minus its skin — that was used to animate the flight of the CG Federation ship through its shots. "To render the 'skin' of the *Enterprise B*, we actually took a bunch of flatly lit detail photographs of the ship with a real long lens from directly above and below, from both sides, and from front and back," Knoll explains. "Since the geometry of the CG *Enterprise D* matched the photographs of the motion-control model, it matched the motion-control model exactly when we laid the texture maps that were derived from those same photos over that geometry!"

Once the *Enterprise B* was

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digitized, animating it in the CG realm enabled ILM to create totally convincing images of the Federation starship entering the Energy Ribbon, interacting with the CG *Lakul* and becoming hopelessly trapped after the *Lakul*'s destruction. "When the *Enterprise* was getting dragged sideways into the Ribbon," Knoll says, "we were able to convey the sense of this huge wind blowing past it using particle systems and shaders on CG sheets perpendicular to camera. The intent was to create an Energy Ribbon atmosphere with a lot of directional motion between the 'camera' and the ship. It looks like a giant storm in space."

The climactic shot of a volatile energy tendril striking the *Enterprise,* blowing Kirk out into space and into the Nexus, was particularly difficult. "We actually used a recycled explosion element from *The Empire Strikes Back* in there, as well as other CG explosion elements and various sources of exploding CG smithereens, some of which John Knoll rendered on his personal computer," Schlag says. "The interaction between the *Enterprise* and the Energy Ribbon had to be tweaked every day. Using CG allowed us to change the animation of the *Enterprise,* the Energy Ribbon or the tendril that came out and whacked the ship."

But the CG *Enterprise B* wasn't reserved only for long shots of the Energy Ribbon; in fact, one of the most dramatic shots of the starship occurs as the camera follows the *Enterprise* closing in on the Ribbon. "It's a medium shot with the Energy Ribbon in the distance and the CG *Enterprise B* filling the right side of frame," Schlag sighs. "All three of our technical directors had their mitts on it at some point. Not only is there a factor of two change in the scale of the Energy Ribbon as we pull into it, but since we're riding so close behind the *Enterprise,* we had to do a lot of work to make it hold up. Rather than going hog wild and fixing every little detail, we just started the shots and fixed the problems as they came up. Scott Frankel did the texture work and Ben Snow did a lot of the sweat work to make the CG *Enterprise* look really good at close range. By the time we were done with it, it was pretty much ready for prime time, at least for medium shots."

Once he saw how well the *Enterprise B* translated into the digital realm, visual effects supervisor John Knoll himself built the CG model of the *Enterprise D* on his home computer, then used the model in some half-dozen shots. Knoll saw the opportunity in *Star Trek: Generations* to bring his career full circle. Even though ILM had only handled effects on *Star Trek - The Next Generation's* pilot episode, it was Knoll who had created the motion-control programming on the warp-drive stretch effect. "So I did the two shots of the *Enterprise D* going into warp drive on the feature," he says. "The original effect was done using motion control and slit-scan, which was really the only thing that was practical at the time. The problem with the slit-scan approach, which involved projecting a slit of light onto the model from front to back, was that we couldn't have rimlight, all the light had to come directly from the side, and we couldn't do slit-scan on a light pass. If you analyze the warp-drive stretch in the TV show, you'll notice that the portholes go off as soon as the stretch starts! It worked fine for what the TV show intended to do, but today it just barely holds up, even on television. When we were faced with doing the same thing for the feature, I figured we should use computer graphics, which would allow us to do the effect the right way — the ship could stretch out, its blinkers could keep going and the lighting wouldn't change. Admittedly, back in 1987, we couldn't really do a completely realistic CG *Enterprise* that looked as good as the motion-control

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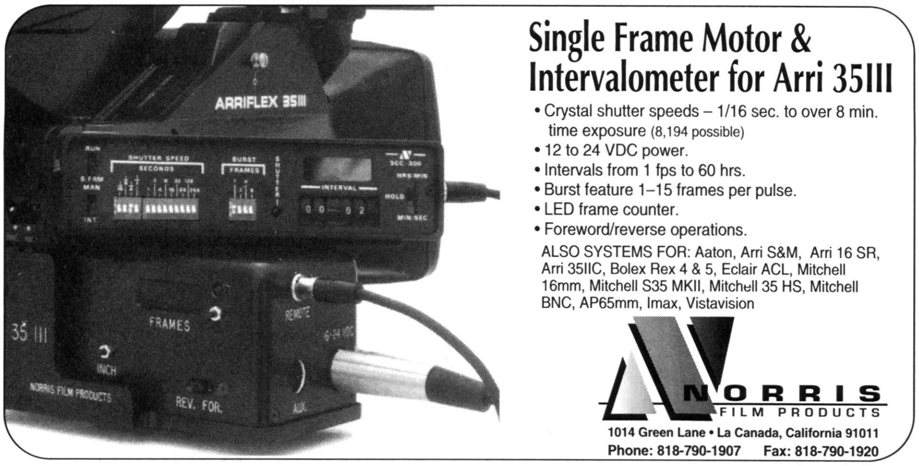
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model, but I think we achieved that this time. Basically, we took a CG model of the *Enterprise D* and just snapped it into warp drive. It's easy enough."

But Knoll wasn't the only one eager to work on a *Star Trek* feature. CG Supervisor John Schlag noted that *Generations* was the easiest film he'd ever recruited talent for at ILM: "After finishing *Forrest Gump*, which was a really difficult show with a huge number of composites we all worked many Saturdays on, I ran screaming into the hills for two weeks, then came back and immediately signed onto *Star Trek*. The thing that made me do it, aside from the interesting collection of shots, was that it gave me a chance to be a part of the whole *Trek* thing, which for better or worse is a significant contribution to American culture. In fact, that's been a significant factor for many of the people on this show. If you think about it, Industrial Light & Magic is practically an entire company filled with *Trek* geeks. People who do special effects don't do it for the money; they do it because they really like what they're doing."

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Zoo in Budapest: Lasky's Poetic Redemption

Renowned producer Jesse Lasky staged his comeback with an ethereal fantasy film that featured deft direction by Roland Lee and luminescent photography by Lee Garmes, ASC.

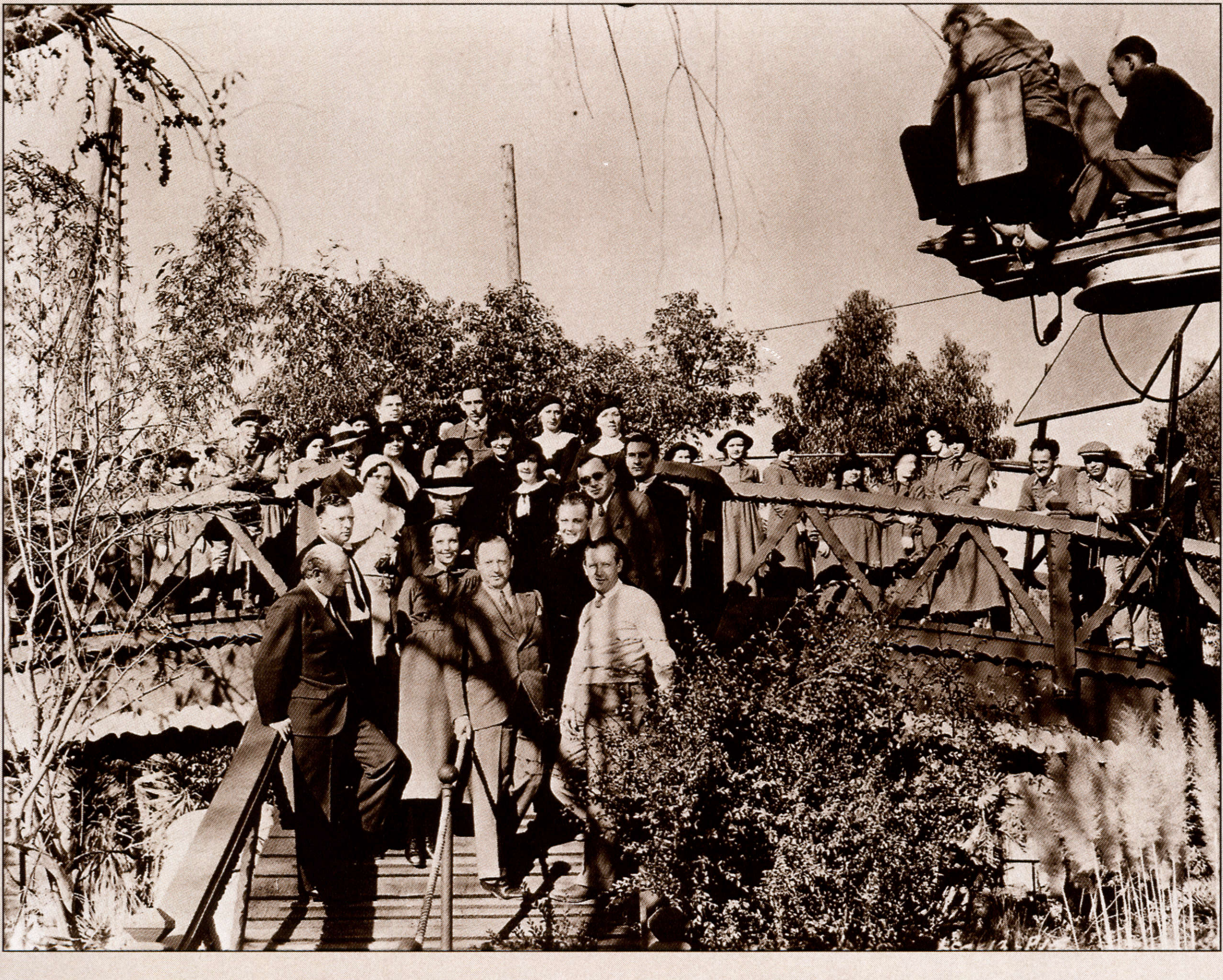
by Betty Lasky

Zoo in Budapest has been called "the most beautiful motion picture ever made." Such praise was a godsend to its producer, a respected pioneer of the industry whose life had suddenly become a shambles and whose future depended largely upon the success of this one film.

On April 30, 1932, my father, Jesse L. Lasky, walked out of his New York office in the Paramount Building for the last time. He had been the victim of a coup engineered by Sam Katz, the powerful, conniving head of Paramount's theater division. Lasky had lost his fortune in the stock market crash and was on the brink of bankruptcy. His beloved sister Blanche, virtually his right arm, had just died. He was battered and brokenhearted, but not beaten.

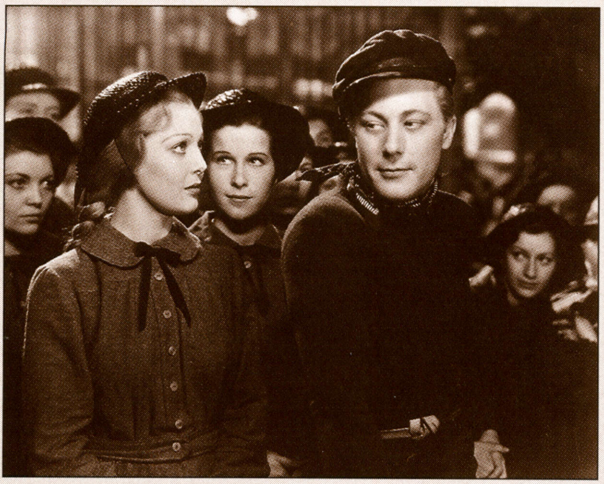
"There's one nice thing about staging a comeback," he wrote in his memoirs. "It gets easier the more times you've done it. The path is familiar. . . you have the advantage of hindsight. . . [and] if you're a movie producer, you have the friendship of those you've helped along the way."

The loss of his first fortune in vaudeville (in 1911) had been a lucky break that led to the movies: the formation of the Jesse L. Lasky Feature Play



Cecil B. DeMille (left, front) visits the Zoo set. Loretta Young, Jesse Lasky, Gene Raymond and Rowland V. Lee are in the front row. Riding the crane are Lee Garmes and Warren Lynch.

Right: *Eve (Loretta Young) and Rosita (Dorothy Libaire) meet the mysterious Zani (Gene Raymond).* **Below:** *Eve hides in the zoo. (Photos courtesy of Margarita Lorenz.)*



Company with his brother-in-law Sam Goldwyn and his best friend Cecil B. DeMille; and then his ascension to Paramount (which in his day was called Famous Players-Lasky), where he reigned as first vice president in charge of production for 16 years. This time it led to an independent berth on the ailing Fox lot.

Having advised my father to get out "before they push you out," Sidney Kent, Paramount's dynamic vice president in charge of sales, had fled the feuding company in the nick of time and landed the presidency of the near-bankrupt Fox Film Corporation. Unable to offer my father the post of studio production boss, Kent made a place for him as an independent producer.

The company for whom F.W. Murnau had directed his masterpiece, *Sunrise*, and where John Ford had cut his teeth, Fox was enduring hard times. Ravaged by greed, William Fox's empire had crumbled. Forced in 1930 to sell out to a group of bankers (whom the Fox family dubbed the "meter men"), Fox Movietone City in Westwood Hills was run by the unpopular Winnie Sheehan, Fox's flashy protege. Lambasted by his enemies, the stout Irishman, whom nobody called "Winfield," nevertheless enjoyed a good relationship with some of his creative personnel. He could count on the studio's reigning star, the inimitable Will Rogers, dashing Warner Baxter, and "America's favorite lovebirds," Janet Gaynor and Charlie Farrell, to overcome the depressed box office.

Loyal Sid Kent went all-out for my father, ordering that a special building be built for him and his staff with a private projection room. He also offered autonomy — at least for the time being. He would not have to take any guff from Sheehan.

Lasky arrived on the Fox lot in his chauffeur-driven Rolls in October to start a new career at the age of 52. His deal was for $3,000 a week and a percentage of the profits of the 18 pictures he would make on a three-year contract without options. Blessed with inborn optimism, his enthusiasm for the movies as great as ever, he fully believed he could make another fortune. Armed with his favorite credo, "You're never broke if you have an idea," he went to work to turn his latest "great idea," an original story about a zoo in Budapest, into a movie.

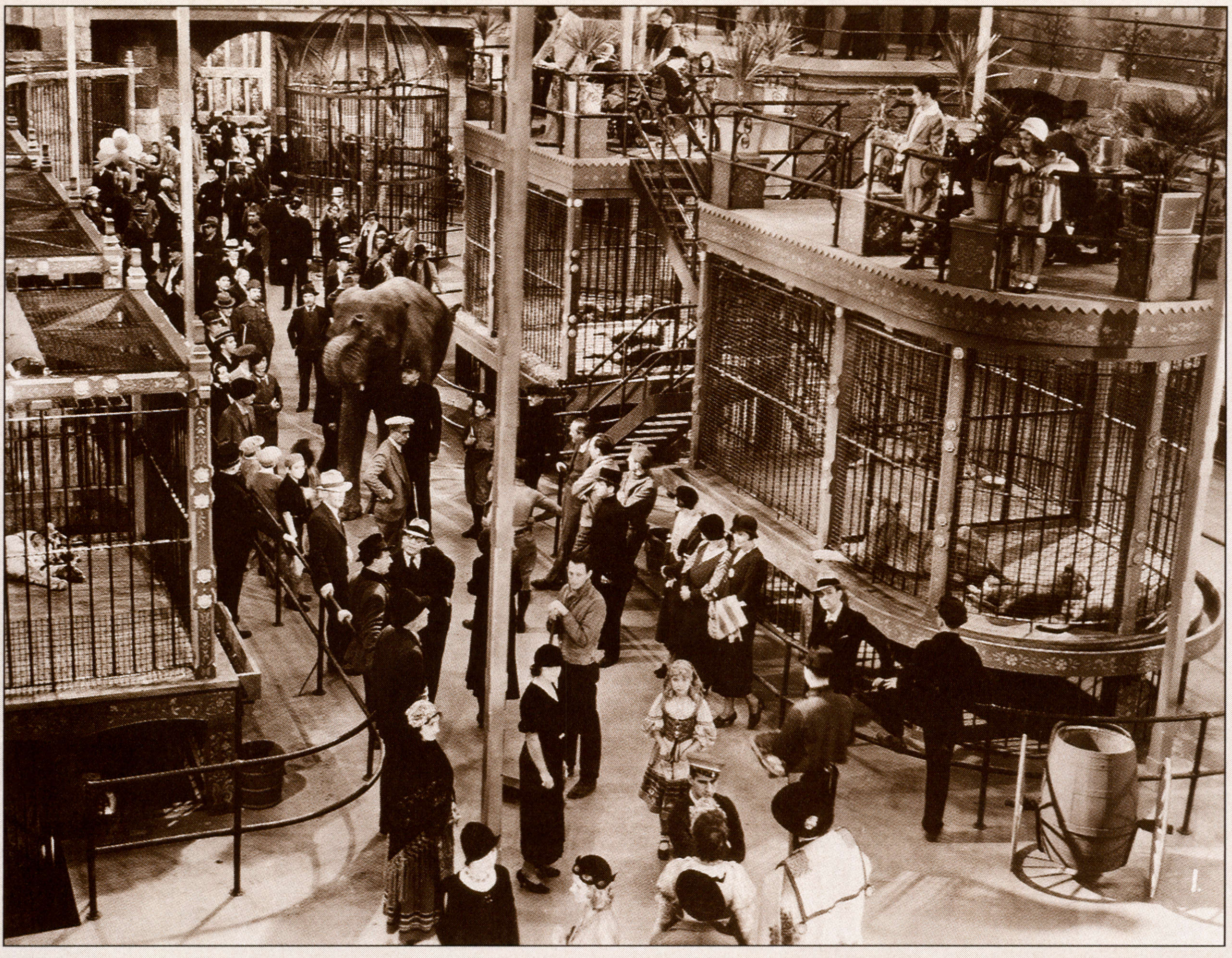
He had hired a sensitive poet, Dan Totheroh, and a fine writer, Louise Long, to prepare the script. However, inherent problems in the story (by Melville Baker and John Kirkland) had crept into their adaptation — distasteful, even offensive characters whom audiences would surely find unappealing.

As luck would have it, my father received a phone call from director Rowland V. Lee, who was anxious to talk to him about a project of his own. Given to hunches, and accustomed to acting on them, he somehow knew that Lee, an educated, cultured man and an experienced director who had trained under Thomas Ince, would have fresh ideas for solving the story problems.

In his unpublished memoirs, Lee wrote of this meeting the next morning, "Before I had a chance to tell Lasky about my story (*Ivanhoe*), he started right in on me."

Ten minutes later, Lee was on his way back to his small house in Malibu with copies of the original *Zoo in Budapest* story and script beside him in his Model A. A job was in sight if he could come up with the answers. Lee settled down in front of the living room fireplace and read and slept intermittently. "It wasn't a task I could rush through," he recalled. Being a deeply religious man, "it required a flood of inspiration to get me into a creative frame of mind; so I opened the doors of my faith, and got a celestial response."

Lee's critique of the script the following morning brought an enthusiastic response from my father. His face lit up with excitement when Lee detailed how he felt the characters could be changed and the story-line developed. Grabbing Lee's arm, he hustled him to his writers' bungalow next door where Totheroh and Long, upon hearing the new concept, shed a few tears and murmured words of gratitude. In rapid succession, my father



Animal cages were built on the largest stage at Fox. (Photo courtesy of Margarita Lorenz.)

placed a call to Sheehan and the two men raced across the lot to the studio chief's office, where they instantly cut a deal for Lee's services as director and co-writer.

"Times are tough," declared Sheehan, who was pulling down a $250,000 yearly salary. "We can only pay you $1,750 a week." Still on cloud nine, my father led his new director and writers to the commissary. "We'll get down to work right after lunch," he said.

As the afternoon progressed, Lee laid out a plan of procedure with his co-writers, then huddled with my father over production requirements. By the time the long shadows of evening swept across the lot, my father started to unwind. He would "sleep like a log tonight," he declared. As for Lee, this would be remembered as "one of the most wonderful and rewarding days" of his life.

The new Fox lot, built on more than 300 acres of scrub ground, was a revelation to Lee. He had made numerous movies with Bill Darling, Fox's chief art director since 1922 at the old Western Ave. (Fox) studio in Hollywood. He couldn't believe his luck when Darling took him on a tour of the backlot, which contained a secluded park and a small lake embracing a tiny island encircled by trees and shrubbery.

"This was made for our picture," he told Darling. "We're shut off from the city. We can shoot from any angle without revealing an inch of Los Angeles."

Hungarian-born and a noted landscape artist, Darling was uniquely suited for *Zoo in Budapest*. He envisioned an arched bridge over the narrow end of the lake, a small walkway leading to the island, and a waterfall — a fairy-tale hiding place for the movie's two young lovers, an innocent runaway orphan and the son of a former zookeeper, a misanthrope who communes with the animals. Darling would add several cages and a bear cave, a refuge for the pair after they leave the island.

Lee selected the largest stage on the lot for the main zoo set. "We'll construct the zoo here, where we can have complete control of the lighting, regardless of the weather," he told Darling. In a mere two days, Darling designed "a masterpiece — a set that thrilled Lasky." But where would they find animals?

A call to I. S. Horne's headquarters in Lawrence, Kansas, brought him to Los Angeles with lists and photos of his stock: magnificent tigers, lions, elephants, leopards, seals, hyenas, porcupines, monkeys, snakes, and an amazing assort-

Near right: *Zani fights with the crazed Heinie (Paul Fix).* **Far right:** *Eve changes clothes while hiding. (Photos courtesy of Margarita Lorenz.)*

ment of exotic birds and waterfowl. My father made a fast deal with Horne for 311 animals and birds, and Fox would soon house the fourth-largest zoo in the country.

Bill Darling, joined by the head prop man and construction foreman, finalized details of the structure of the zoo set. It was to be erected on two levels, with the upper level to serve as a walkway for visitors to peer down at the cages. "Extra safety factors" would be added.

Lee now spent mornings "developing the script with Louise and Dan" and the afternoons conferring with Darling on the main set. My father had signed cameraman Lee Garmes, ASC, who would have two other first cameramen working under him. With three additional crews in action — Charlie Van Enger, ASC concentrating on closeups of wild animals; Johnny Schmidt taking thousands of feet of animal shots, including some of animals that would be loose; Jockey Feindel, ASC and his crew specializing in intimate shots of birds — Lee and Garmes knew they would be going at a breakneck pace "picking a setup which was being lit," while they raced (in cars) to the locations where the other units were shooting, to supervise their shots.

My father had signed the two young leads before Lee came on the film. Loretta Young, barely 20 and a breath-catching beauty, proved the perfect choice for Eve, the gentle, timid, unworldly heroine. She had worked with Lee before on *The Ruling Voice* (1931). For his leading man, Lee ironically was forced to borrow Gene Raymond, his own discovery, whom he had snatched from the Broadway stage and placed in Paramount's stock company a few years back. The strikingly handsome young actor with corn-dyed hair was practically a family member, spending every weekend at my parents' Santa Monica beach house. Earl Luick, Fox's chief costume designer, may have missed the sight of Raymond strolling on the beach in his biceps-hugging T-shirts, but they somehow found their way into Gene's Zoo wardrobe. Lee noted that he was "a superb gymnast," and wrote scenes that "demanded his athletic skill and prowess."

On January 13, my father celebrated the anniversary of his 20 years in the film industry, and the start of *Zoo*, at an informal luncheon at the studio. His rise and fall had already been well-publicized, he pointed out. Now he wanted to add a new chapter. "I feel today the same as I did twenty years ago when Mr. DeMille and I made our first picture, *The Squaw Man.* I start anew, and I hope this picture we begin today will go down in history just as our first feature did. But when I rise again this time, if I'm fortunate enough to do so, I'll quit when I reach the pinnacle."

The final script of *Zoo* was, like all fairy tales, simple yet profound. The writers had rid the story of all its negative elements. Zani, Raymond's character, a Tarzan-like creature, was no longer a common thief. His habit of snatching fur pieces from the necks of wealthy women visitors and burning them was justified by his view that "people shouldn't kill animals and wear their furs."

Dialogue clearly defines the characters. Zani wishes that the zoo director, Garbosh (Murray Kinnell), who wants him expelled from the zoo, would "go sit on a porcupine." Zani's mentor and father figure Dr. Grunbaum (O.P. Heggie), tries in vain to instill in him respect for the laws of the outside world. Zani's concern is for a deer secured nearby. Grunbaum's loud voice, he warns, will frighten the creature. "Her ear is so tender it's like a leaf," he murmurs.

Zani's only other human attachment is for Eve, one of the group of girls from the orphan asylum that are marched two-by-two through the zoo every Thursday, accompanied by their severe matron. Just turned 18, Eve is destined for servitude in a tannery. Zani tries to imbue her with the courage to escape. "You are caged in, just like the animals," he whispers while dangling from the bars of a lion's cage. "Just think of the fun you'd have if you'd only take a chance; you'd be free, you stupid." Proper social behavior is not a part of Zani's makeup.

Dusk falls; the orphans advance in military

Garbosh (Murray Kinnell) tries to bar Zani from the zoo. (Photo courtesy of Margarita Lorenz.)

formation across Darling's arched bridge, keeping step like toy soldiers, the fading light filtering between their figures bringing to mind a Rembrandt painting. Eve escapes, hides in the marsh and waits for Zani to find her. As the mist rises, the zoo's exotic waterfowl — swans, flamingos, cranes, pelicans — float by her, creating an impressionistic image. Musical director Louis de Francesco would later mix flutes, French horns and bird calls to heighten the effect of the scene. Eve sheds her drab orphan's uniform for a peasant skirt and shawl. Hugged by the camera, all eyes and elongated neck, she is akin to a graceful water bird.

Zani arrives, feels her beating heart and notes her change of clothing. "You're all moulted . . . you changed your feathers like a bird," he says in astonishment. Soon it will be dark; he will carry her across the shallow lake to safety.

On his daily visits to his projection room to view the rushes, my father felt that *Zoo* was taking on a poetic dimension. Cinematographer Lee Garmes, a friendly, unassuming man but a consummate artist, had worked for him at Paramount on Josef von Sternberg's *Morocco, An American Tragedy,* and most recently, *Shanghai Express*. His contribution on the last film, starring Marlene Dietrich, so mesmerized my father (and fellow movie-makers who voted for Garmes at Oscar-time) that he considered him a natural for *Zoo*.

"I remember we waited long hours just to get the right shot on *Zoo*," Gene Raymond recently told film history writer Margarita Lorenz. "Especially for the lake scene, when I carried Loretta across."

Loretta Young recalled that "we shot the scene about a quarter to six, after rehearsing all day. Any other producer would have been tearing his hair out, but Jesse Lasky was that appreciative and that artistic; he said 'No, this has got to be beautiful.' He was marvelous to work for because he had exquisite taste. Well, we finally did it in one take. The special effects man placed dry ice around the lake to get the effect of mist. The swans were pushed at just the right moment, and he (Raymond) carried me across."

The water shimmers and the majestic swans float by, just as Zani, holding Eve, wades through the reeds, his figure captured by the camera in silhouette.

In the spectacular finale, Paul, a lost little boy (Wally Albright, Jr.), accidentally pulls a lever that permits Sultan, the tiger, to escape. Right on cue, Rajah, the elephant, breaks loose and pushes through a brick wall, crashing into cages.

Jessy Lasky and a member of the cast.

Thirty-eight years later, on the occasion of *Zoo*'s revival in London, Tom Milne (for the London *Observer*) described the scene: "All hell breaks loose as a maddened elephant splinters an entire wall and cages go sprawling like matchwood. Soon the whole place is a terrifying snarling bedlam, with porcupines scurrying off like a Lilliputian army, great cats battling savagely for supremacy, and elephants on the verge of stampede."

"Even now I cross my fingers when I recall the risks many of our crew took," Lee commented on the rip-roaring finale, "but thank heaven, we did not have one single accident on the whole picture."

Zani and Eve owe their salvation to Zani's bravery, with a little assist from his friend Rajah. They will now live happily in the outside world, Eve having learned from Zani to trust her feelings and the laws of nature; Zani, in turn, will be tamed by her feminine qualities.

Zoo was previewed in Westwood Village on a Friday night in late March (1933). A college town populated by occasionally prankish students, it would seem an unlikely choice for an arty film. True to form, a couple of rowdies down in front threw several stink bombs during the first reel. The only people to leave their seats, however, were those closest to the stench, and they stood in a side aisle for a few minutes, then sat down again.

On April 4, my father wrote a letter to Lee which the director would treasure for the rest of his life. It was, he said, "the only written commendation I ever received from a producer." It offered him "my very deep gratitude for your inspired direction. Too often in this business credit is given in the wrong direction; I do not want to let that happen in this case. My association with you in producing *Zoo* has been one of the most pleasant experiences I have had in my many years as a producer."

Despite my father's intentions to emphasize Roland Lee's enormous contribution, *Zoo* was talked up by Hollywood as "a Lee Garmes film."

Zoo opened at New York's Radio City Music Hall, April 26, 1933, to an avalanche of praise, including special editorials. But *Zoo* had been brought in at a negative cost of $380,000, a medium A budget for 1933, and did only fair business, coming in at number 19 in gross rentals out of Fox's 51 releases that year.

Gene Raymond recalled that *Zoo* was hurt by the release of Paramount's *Murders in the Zoo* several weeks earlier. "Our picture was artistic," he points out. "Theirs was more of a horror film."

Zoo disappeared from sight until the late Sixties, when it turned up among reels of decomposing prints, and, thanks to the efforts of producer Alex Gordon, was restored. Shortly after, *Zoo* was awarded "Classic" status at the Library of Congress and in August 1971 it stood out as "the great rediscovery" at the National Film Theatre's Tribute to Fox: "*Zoo in Budapest* is perhaps the finest of all — a strange poetic phantasy which reverberates like one of Blake's 'Songs of Innocence,'" wrote Tom Milne.

My father followed *Zoo* with other artistic successes that nourished his soul, thrilled countless critics, but left the box office underfed: *The Power and the Glory*, *Berkeley Square*, *I Am Suzanne*, and many more.

Meanwhile, Fox had changed hands. In May 1935, the "meter men" had formed a new alliance with 20th Century Pictures' young Darryl Zanuck, Jack Warner's former right-hand man, and his senior partner, the popular Joe Schenck. Schenck invited my father to stay on at the new Twentieth Century-Fox, but he chose instead "an interesting offer": a partnership with Mary Pickford to produce at United Artists. He hadn't reeled in another fortune yet, but it was still on his agenda.

Betty Lasky is the author of "RKO: The Biggest Little Major of Them All" (Prentice-Hall, trade paperback Roundtable Publishing). Works in progress include a book about Dorothy Arzner (with Margarita Lorenz) and a revision of Jesse Lasky's published memoirs, "I Blow My Own Horn."

Zoo in Budapest Credits

A Fox Film Corp. *release produced by* Jesse L. Lasky Productions; *directed by* Rowland V. Lee; *screenplay by* Dan Totheroh, Louise Long, Rowland V. Lee; *story by* Melville Baker, Jack Kirkland; *director of photography*, Lee Garmes, ASC; *art director*, William Darling; *editor*, Harold Schuster; *wardrobe*, Earl Luick; *musical director*, Louis De Francesco; *sound recording*, E. Clayton Ward; *assistant director*, William Tummel; *additional cinematography*, Charles Van Enger, ASC, J. Arthur Fiendel, ASC, John Schmidt; *camera operator*, Warren Lynch; *assistant cameraman*, Warner Cruze; Western Electric *sound; running time, 82 minutes; released August 17, 1935.*

Eve, Loretta Young; *Zani*, Gene Raymond; *Dr. Grunbaum*, O. P. Heggie; *Paul Vandor*, Wally Albright; *Heinie*, Paul Fix; *Garbosh*, Murray Kinnell; *Katrina*, Ruth Warren; *Karl*, Roy Stewart; *Elsie*, Frances Rich; *Vandor*, Niles Welch; *Miss Murst*, Lucille Ward; *Toski*, Russ Powell; *Rosita*, Dorothy Libaire; *Mrs. Vandor*, Margaret Fields; *Kretz*, James Burtis; *Ferenc*, Perry Ivins; *Miss Fennock*, Doro Mirande; *Captain of Police*, Claude Peyton; *Emma*, Raida Rae; *Freda*, Ruth Marion; *Man*, Joe Bernard; *Old Man*, Tom Ricketts.

Digital Technology Makes You Look Younger!

compiled by Marji Rhea

Skin Contour System

Among the more catchy of the hundreds of slogans shouted from beneath the "Digital Revolution" banner is this headline, taken from a recent BTS press release: "Award-winning Technology Instantly Takes Years Off Appearance of On-Air News Anchors, Performers." Suprisingly, you won't find this product hawked on late-night infomercial. You will find it on the Television Academy's 1994 list of Technical Emmy winners. The release continues:

In the late 1980s, RCA was the first company to develop a skin hue-based softening circuit in their TK-48 camera project. When the company pulled out of broadcast video, the camera died with it. The technology was picked up by Ikegami Electronics, which developed a manual single-channel system. Greg Pine, BTS marketing manager for cameras, proposed a dual channel, fully automatic system to make fast, accurate setups a breeze even for inexperienced video operators. The finished product came to market in 1993, beginning with the LDK 9 CCD camera. The Emmy, BTS' fifth overall, was shared with Ikegami and was awarded in October, 1994.

The system is a hardware/software combination consisting of a "piggyback" board on the control and the first video processor board. Actual skin control is done through a menu on the camera system's master control panel. During setup, the operator evaluates the subject's face and determines which areas will be processed. Once the system samples the proper color range, the operator can apply it to the person's entire face, and can also soften targeted areas to reduce complexion irregularities including age lines. The skin contour profile will stay with the person as he or she moves and backgrounds change. The skin contour system is available on all BTS LDK 10/10P and LDK 9/9P/9W CCD cameras.

For information: BTS, 94 W. Cochran St. Simi Valley, CA 93065. Ph. (805) 584-4700; Fax (805) 584-4750.

Waterproof Camera Housing

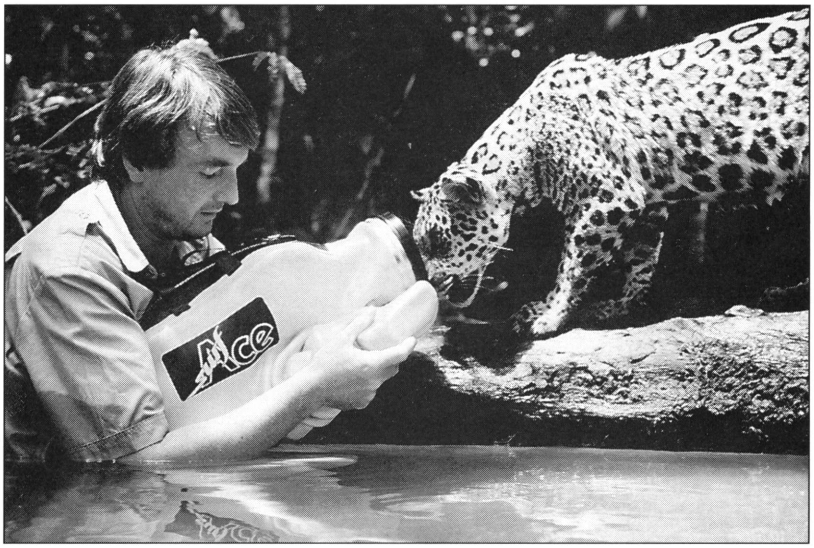
While shooting his latest wildlife film for Survival Anglia in the Amazon jungle, cameraman Nick Gordon needed to get in-water and underwater shots of the wild jaguars who star in the film. The problem was that conventional hard-cased underwater camera housings are bulky, heavy to transport, and take some time to assemble. The solution was Scubacam's SurfAce Arri SR splash bag. Made from 2mm thick natural latex, this lightweight, robust housing can be either handheld or mounted on a tripod. It has an integral Arri 116 eyepiece and camera and lens functions can be easily accessed. Installation and removal of the camera is quick and simple, and the housing is sealed with a heavy-duty watertight zip which will allow a maximum operating depth of two meters.

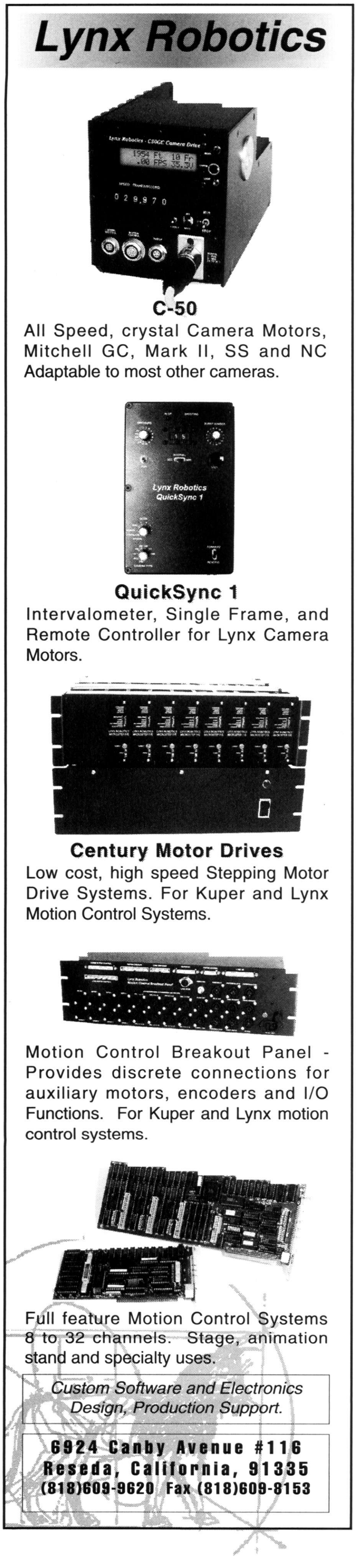
For information: John Johnson, Scubacam Ltd., 44.181.567.8408, FAX 44.181.840.3343.

Multimedia Furniture

Wright Line's MediaLinx workstation furniture and Optimedia multimedia storage cabinet are designed for multimedia, video editing, graphics and electronic publishing systems users. MediaLinx provides modular housing and work space for monitors, computers, tape decks, scanners, printers, towers and other electronic equipment. Optimedia is for organizing CDs, disks, tapes, software and other commonly-used supplies.

MediaLinx is configurable to any size and any facility, from individual editing and development offices to large broadcast and production installations. Its open-frame design allows for future reconfiguration or expansion of individual or team workstations. Systems feature two work surface depths, including a 36-inch-deep model for larger monitors and CPUs. MediaLinx also offers swivel arm mounts that hold large monitors, retractable keyboard trays, rolling floor stands for easy access to the back of tower CPUs and 19-inch integrated rack mounts. The system features superior-strength shelving units with individual weight capacities of up to 750





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pounds. MediaLinx also provides built-in cable ducts that eliminate tangled wires and cables.

Optimedia cabinets are available in eight heights, with a choice of 40 storage components and four door options, including the widely-used tambour door. Designed to save aisle space by receding into the cabinet when opened, Optimedia's tambour door is configurable in two formats, the side-opening Sidewinder model and the bottom-to-top opening Classic.

For information: Wright Line, 160 Gold Star Blvd., Worcester, MA 01606, (508) 852-4300, FAX (508) 853-8904.

Nikon 35mm Lenses

Bergerson Film Production Service's modified Nikon 35mm SLR lens, the Nikon Tilt Lens, is designed for cinematographers who want to have more control over depth of field than just adjusting the aperture. The Nikon lens is set in a ball joint inside an Arri PL mount. The cinematographer can obtain the looks of large-format bellows cameras quickly and with lenses as fast as T1.2. What the lens cannot do is shift, which controls perspective distortion.

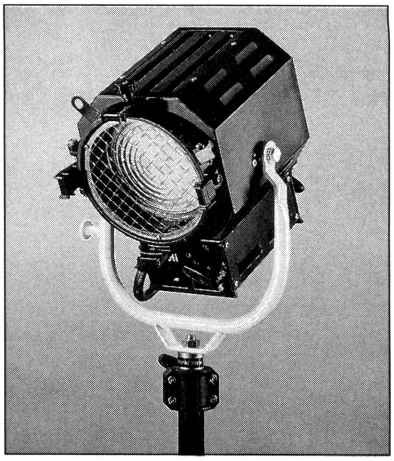
A wide selection of primes is available in 24mm T2, 35mm T1.4, 50mm T1.2, 85mm T1.4, and 105mm T1.8. The lenses tilt up to 15 degrees in any direction. A follow-focus gear is standard on all lenses for use with any follow focus. The lenses can be used on any 16mm and standard 35mm motion picture cameras with PL mounts. An adapter mount is also available to use clip-on 4 X 4 matte boxes with either a 15mm or 19mm sliding base plate.

Setup is as quick as a normal lens change and the cinematographer can see the results as he/she tilts the lens to create shallow or deep-focus shots. These lenses will produce the look popular in commercials and music videos without the user having to worry about lighting the subject to a T5.6 or higher.

For information: Bergerson Film Production Service, 4002 Second Ave. NE, Seattle, WA 98105, (206) 547-4775.

Lighting Products

DeSisti Lighting has introduced three new discharge daylight units, a Fresnel spotlight and two open-face Par lights. The Rembrandt Piccolo 12/18K is designed to be used as a key or fill light for studio or location work where high output is demanded with size and weight restrictions. The unit uses DeSisti's unique construction, which features the use of a double-ended discharge lamp to ensure a smooth uniform field through the unit's full focusing range, from spot to flood.



The luminaire also features a high-voltage igniter location on the lamphouse base for improved cooling and increased protection of critical components' insulation; local and remote operation via momentary push buttons; a digital hour counter; a safety cutoff which stops power in case of lens breakage or when the unit's door is open; and a special bi-metallic-clad aluminum reflector that offers high reflectivity and long life. The unit's 24" Fresnel lens comes with its own wire guard, and its octagonal-shaped brushed stainless steel housing is finished with high-temperature, heat resistant, electrostatically deposed black epoxy paint.

The small and compact Remington 200W open-face Par features an innovative lens and accessory holder that eliminates any light spill. The unit can be run from either a main ballast with universal automatic input selection or by battery-operated DC ballast. Its UV filter-protected lenses (four different types) allow for changing beam patterns with easy insertion/removal. The Remington 200W's design also allows for simple access for bulb changing and features an efficient air flow to aid in heat dissipation.

The Remington 6000W open-face Par features an innovative focusable high-efficiency optical system that replaces and outperforms larger power sources. In addition, the Remington's unique focusing carriage also serves as a support to prevent bulb sag and its accompanying focusing problem. The design of the unit's convection cooling system allows for positioning freedom with compact dimensions and lightweight, making it ideal for location shooting. The unit also features an external knob for bulb locking/unlocking and a special cam that guarantees bulb tightening; a bulb spring retainer to prevent accidental displacement; and easy access for bulb insertion/removal.

For information: DeSisti Lighting, 1109 Grand Avenue North, Bergen, NJ 07047, (201) 391-1100, FAX (201) 391-1104.

Dolly Wheels

Willy's Widgets' track wheels for doorway dollies allow a doorway dolly to be run on straight or curved track or any tube or pipe, including ABS plastic plumbing pipe. The wheels fit doorway dollies with ¾" axles; other sizes are available by special order.

The company's 32-wheel channel rigs for under camera dollies make for smoother dolly moves when used under the wheels of Fisher and Chapman dollies. The rigs put 32 wheels on the track instead of four. Everything is included: aluminum channels, wheels, bearings, swivel and slide blocks and all bolts. Channels are 30" long and 8" wide and take Fisher wheels. Insert blocks are included for use with Chapman wheels.

For information: Willy's Widgets, 4531 N. 87th Place, Scottsdale, AZ 85251-1812, (602) 945-6428, FAX (602) 990-2088.

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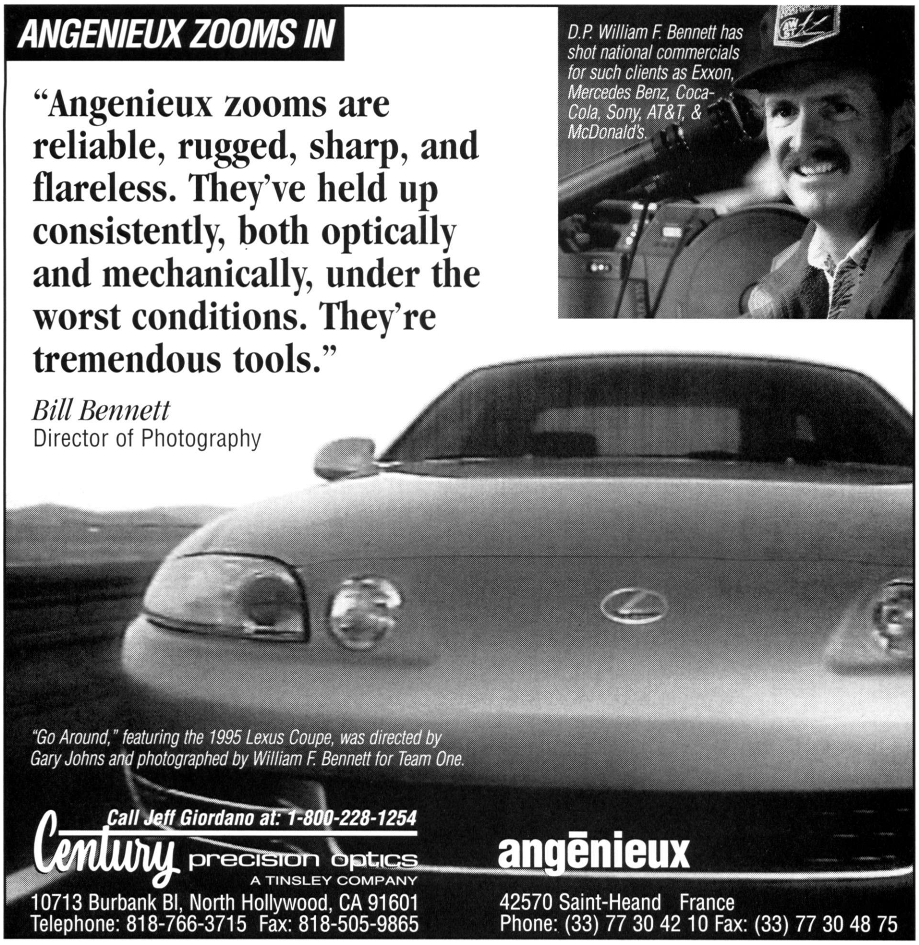
Mid-Range Lighting Consoles

Strand Lighting's mid-range 430/530 console is an Intel 486 or Pentium-based platform with 24 by 6 pages of submasters, 6 "Supermasters," three large graphic LCD displays, macro keys and two VDU displays. In addition, the Strand 430/530 consoles provide true multi-attribute control for moving lights (with tracker ball, scroller frame push buttons and four rotary encoders) when the optional Tracker application software package is installed. The word "attributes" refers to the non-lighting elements of the control system, such as color scrollers, pan, tilt, focus and gobos for moving lights.

The base operating software is Lightpalette from Strand's console range. Lightpalette provides the features and "feel" of a Lightpalette90, with tracking and command line programming and setup features for alternative operational methods. For those users not familiar with Lightpalette operation, Strand offers the alternative Genius Plus base operating software. Originally created as Genius for the GSX and LBX consoles, Genius Plus takes the same "preset-style" operation with additions in line with the Strand 430/530 control surface, and it also incorporates special effects and color scroller features.

The maximum capacity of the Strand 430/530 is defined through the level of Lightpalette or Genius Plus software installed — from 100 to 600 dimming channels in steps of 50. In addition, 100 to 400 color or moving light attributes may be controlled over and



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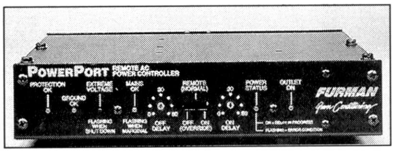
For information: Strand Lighting, Inc., 18111 South Santa Fe Ave., Rancho Dominguez, CA 90221, (310) 637-7500, FAX (310) 632-5519.

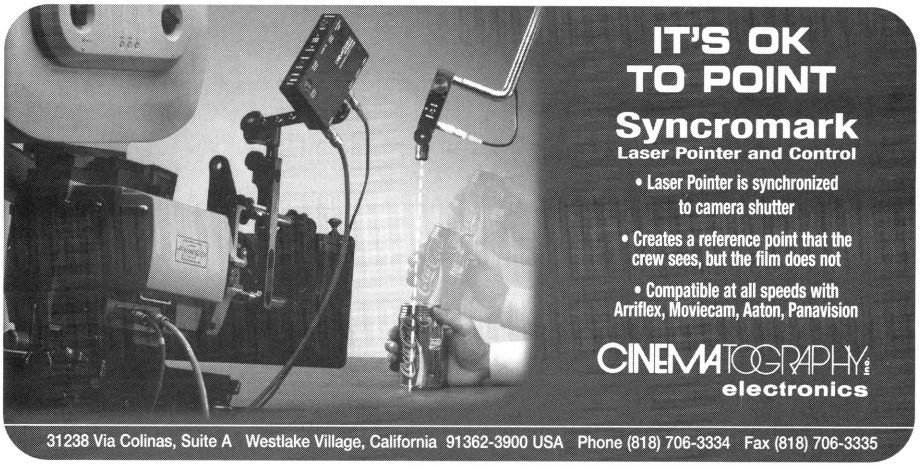


AC Power Controller

Furman Sound's PowerPort AC power controller and power conditioner has remote-activated, delayed switching and remote LED monitoring. An individual PowerPort provides on/off control, on/off timing, monitoring of abnormal conditions, and power conditioning capability for a single equipment site drawing up to 20 amps or 2400 watts. Any number of PowerPorts may be simply networked for total system control.

PowerPorts are designed for even the largest audio, video and multimedia installations. All critical circuit functions are governed by an internal microprocessor. Installed systems can grow to any size by adding more PowerPorts to control additional 20-amp circuits, with the entire system conveniently switched on and off from one or more locations with either maintained or momentary contact switches. Each PowerPort has independent, adjustable turn-on and turn-off delay controls, allowing multiple units to be switched on and off in sequence.

The PowerPort offers the same RFI/EMI and spike/surge protection as the new Furman PRO Series rack-mount power conditioners. Furman's unique combination of MOVs, gas discharge tubes, fast-blow fuses, high-voltage inductors and capacitors, and precise high in-rush magnetic circuit breakers can safely absorb and dissipate a whopping 11,000 amperes of spike/surge current in any mode from nearby lightning strikes, as well as filter any audible high-fre-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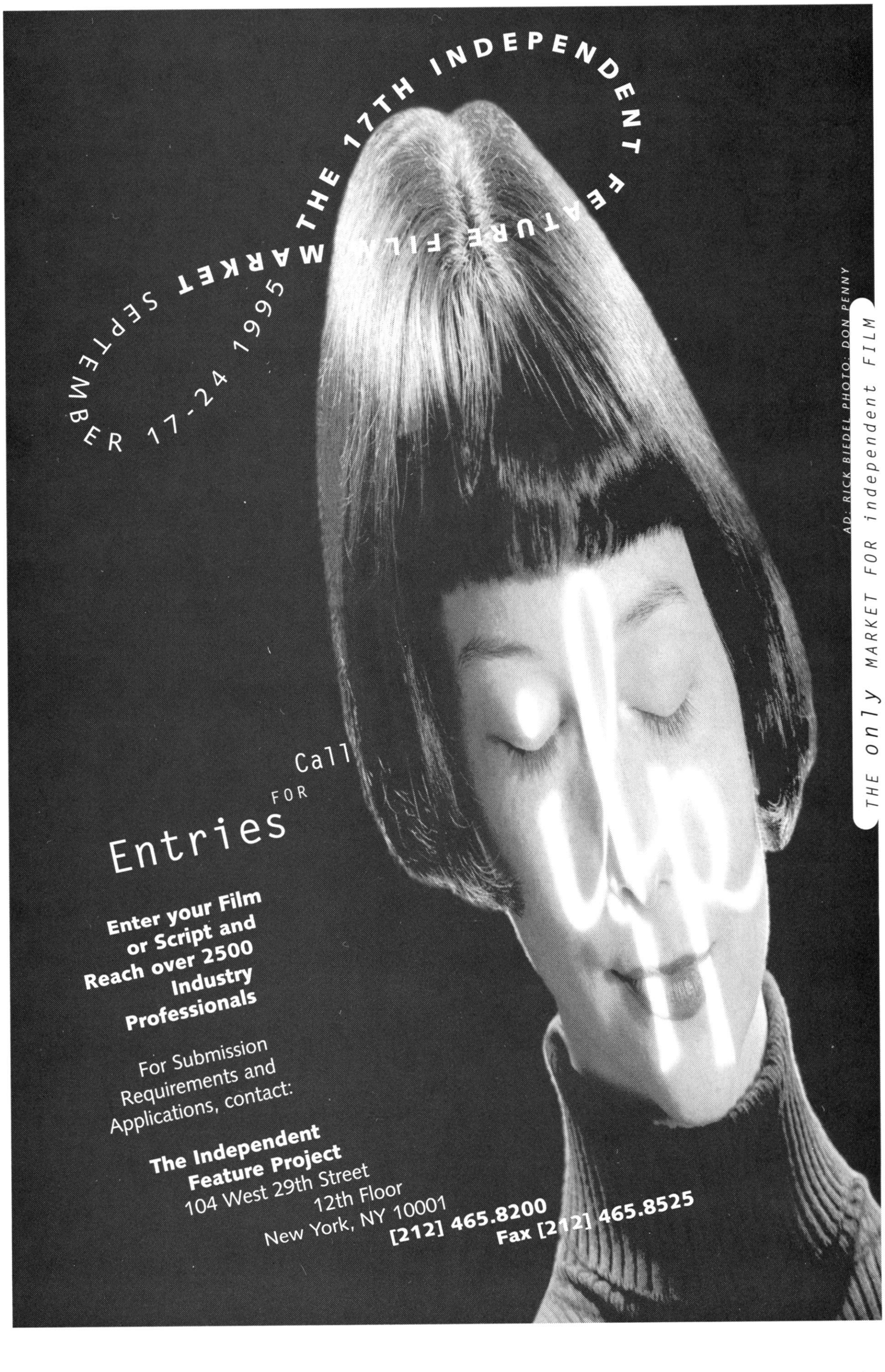
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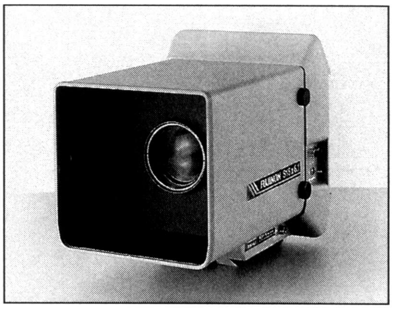
For information: Furman Sound, Inc., 30 Rich St., Greenbrae, CA 94904, (415) 927-1225, FAX (415) 927-4548.



Studio Production Lens

Fujinon's S15X6.1 ESM features Fujinon's Aspheric Technology, which provides control over spherical aberration and better overall optical performance than lenses employing only spherical lens elements. The lens also has enhanced focus tracking, better corner registration, and greater brightness than other similar 1/3" studio production lenses.

Standard features include a built-in 2X extender that can be deployed via a remote demand unit or shot box. The focal length of the S15X6.1 ESM is 6.1 to 91.5mm, and its zoom ratio is 15X. Maximum aperture is F1.4 to 82mm and F1.6mm at 91.5mm, and minimum object distance is 0.7m.

For information: (201) 633-5600.

Production Forms for Macs

Enterprise Printers & Stationers, in association with Situational Ethics Software Development, is now offering its industry-standard Production Report and Call Sheet forms bundled on disc for use with Microsoft Excel for the Macintosh. The package features a fully interactive Call Sheet and Production Report in 8 ½" X 14" U.S. legal size. Both forms are two-sided. Users can easily access and print out updates of either form. The forms run in Microsoft Excel versions 5.0, 4.0, or 3.0 for the Apple Macintosh. A version for Excel for Windows is also scheduled for release.

For information: Enterprise Printers & Stationers, 7401 Sunset Blvd., Hollywood, CA 90046, (213) 876-3530, FAX (213) 876-4398.

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Gepco International's line of packaged audio and video cable assemblies are designed to free engineers from the tedious task of assembling finished cable and connector assemblies themselves, and are for use by major television and radio networks, recording studios, and video facilities, among others. The assemblies can be customized by length, color, type of connector and application, from a single microphone cord to a complex wiring system.

For information: Gepco International, Inc., 2225 W. Hubbard, Chicago, IL 60612-1613, (312) 733-9555, FAX (312) 733-6416.

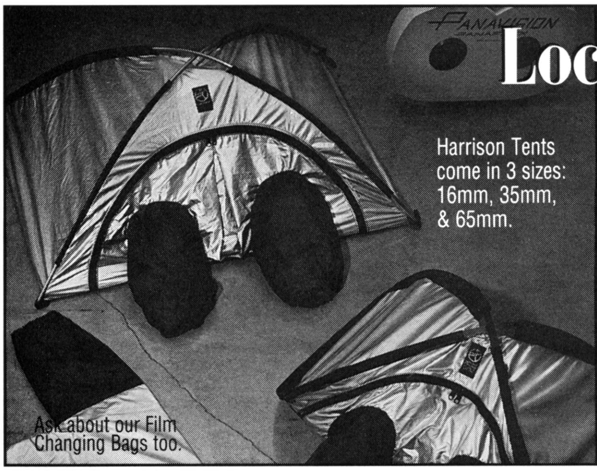
Linear Editing System

Pinnacle Systems and United Media have combined forces to offer a completely integrated desktop solution by providing a direct software link (API/DDL) interface between United Media's MultiVision System (MVS) Linear Editor and Pinnacle's Alladin Media Printer.

With the flexibility of sync rolling from 2-7 VTRs from a single plug-in card, the MVS Linear Editor utilizes all four inputs of the Alladin's Switcher by sync-rolling A/B/C/D/E & F rolls, thus providing an affordable and open-architecture system.

Both the United Media MVS Editor and the Alladin run under Windows and can reside in the same computer or on different computers. The MVS Linear Editor displays Alladin effects on the MVS display, recalls preloaded Alladin effects, previews these effects, and moves the timeline frame by frame via the MVS Editor's program.

For information: United Media, 4771 E. Hunter, Anaheim, CA 92807, (714) 777-4510, FAX (714) 777-2434.



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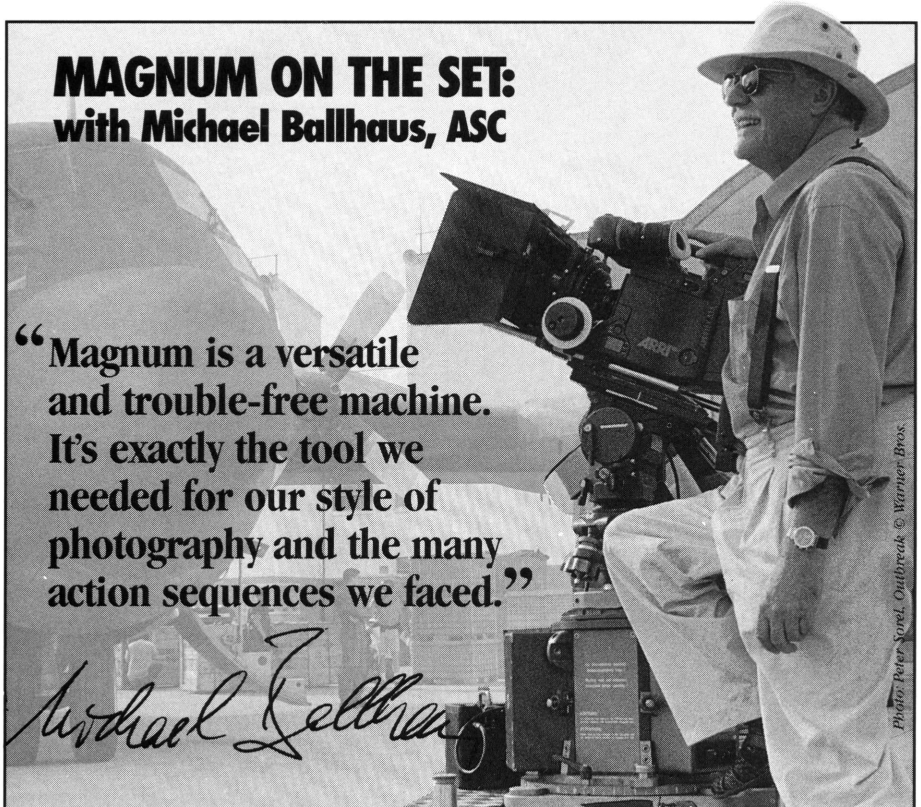


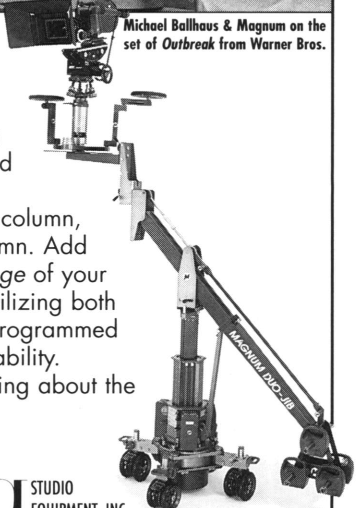
MAGNUM ON THE SET:
with Michael Ballhaus, ASC

"Magnum is a versatile and trouble-free machine. It's exactly the tool we needed for our style of photography and the many action sequences we faced."

Michael Ballhaus

Photo: Peter Sorel, *Outbreak* © Warner Bros.

Michael Ballhaus & Magnum on the set of *Outbreak* from Warner Bros.



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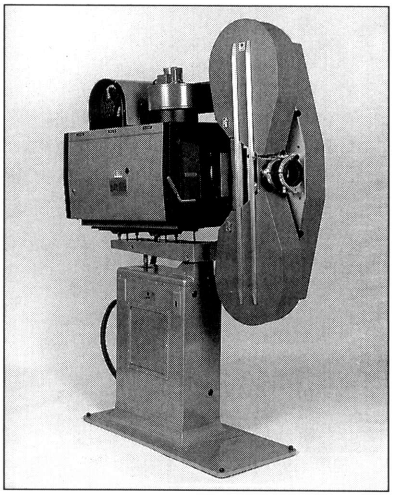
Helicopter Search Database

Helicomp Systems' Helinet for Windows software for the PC is designed to locate helicopters and helicopter companies quickly and easily. The user may search for helicopter companies by city, state, state region, company operations or helicopter fleet. Pictures of popular helicopter models are included for reference, as well as pertinent information and technical data. The database includes more than 3,300 helicopters nationwide.

For information: Helicomp Systems. 1475 Fourth St., Napa, CA 94559, (707) 257-2093, FAX (707) 257-1314.



70mm Projector

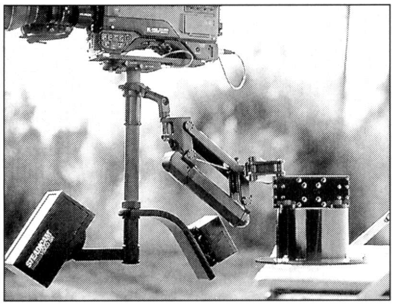
Pioneer Technology's Model 70/8P version of their Linear-Loop Projector is outfitted with the Hughes-Leitz 17mm lens, presenting a 163-degree field of view and yielding 80 lines/mm resolution. The Model 70/8P is a dual-speed projector which operates at 24 or 30 frames per second. Featuring pin registration, a flat film plane and excellent shutter efficiency, the Linear-Loop projects high-quality, steady images. The projector is also available in other models, the 35/8P, 70/5P and 70/10P. All models provide automation capability not available in other film projection systems.

For information: Pioneer Technology Corporation, 1021 N. Lake St., Burbank, CA 91502, (818) 842-7165, FAX (818) 842-0921.

Clamping French Flag

The Clamping French Flag, designed by a camera assistant who noticed how clumsy and expensive traditional flags are, can be clamped onto the matte box or body of any type of motion picture or video camera. Separate rod adapters for Panavision or Arri are not needed. There are no wing-screw attachments to fumble with, and there is no need to remove the matte box or change anything on the camera setup. The strong spring clamp has a rubber-faced jaw opening that sticks to any surface and won't slip or scratch. The arm is much more flexible than metal arms and makes a 5 ½" diameter circle. The flag stays solidly in whichever position it is placed, and its length is hand-adjustable by simply popping out segments. The flag is lighter than metal flags (1 lb., 4 oz.) and can be stored compactly by breaking the arm apart. A Maglite holder is included for transforming the unit into an adjustable lens light.

For information: Clamp Flag Company, 1630 30th St., Suite 300, Boulder, CO 80301, (800) 547-FLAG.



Steadicam Mounting Device

Cinema Products' Vehicle Mount is a film and video camera support system designed for use with the company's line of Steadicam products. The Vehicle Mount replaces the vest worn by Steadicam operators and attaches to a truck or other vehicle or even a camera dolly. By supporting the weight of the camera, the vehicle mount enables operators to use a Steadicam for longer periods of time and to shoot while moving at speed.

Two versions of the device are available, one for use with the Steadicam Video SK, the second for use with the Steadicam EFP, Steadicam III A and Steadicam Master Series. The Mount's design includes precision aluminum construction and scratch-resistant powder coat exterior coating.

For information: Cinema Prod-

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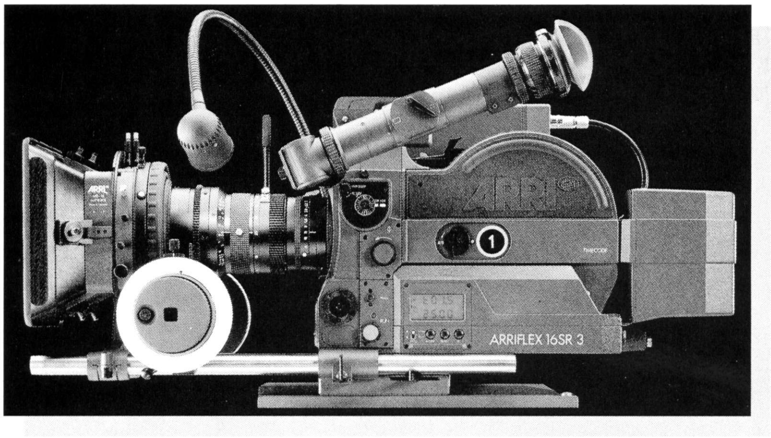

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Incident Light Meter

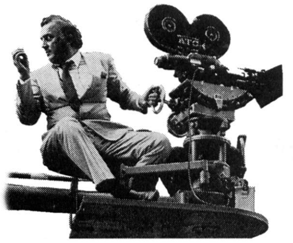
The Cinemeter II incident light meter, designed specifically for cinematography, requires no secondary calculations to determine camera aperture because all the camera variables — ISO, fps (2 to 375 fps), shutter angle (45 to 205 degrees), and filter factors (⅓ stop increments up to 7 stops) — may be entered. The unit has three modes of display, including the "Floating Zone" mode in which all areas of the set can be read and displayed as a range of f/stops or footcandles. Separate readings can then be taken at multiple locations on the scene and digitally displayed, enabling the user to instantly assess how a single area relates to the full f/stop range of the set.

For information: Marsh/Glickman Enterprises: 2740 W. Magnolia Blvd., Suite 302, Burbank, CA 91505, (818) 563-2619, FAX (818) 563-2592.

Exposure Meter

Minolta's Flash Meter V exposure meter for flash and ambient light uses an innovative intelligent auto mode and distinguishes flash light from ambient light, and cord/non-cord operation automatically. The unit also offers a new simplified design, eight memory settings, a flash/ambient scale, brightness difference readout, and other features.

For most applications, the auto mode is all that is required. Shutter speed and aperture values are changed by a positive-action dial. Switches that are used less often are located under a sliding cover, and switches for setting basic meter functions (which will be changed rarely, if at all) are hidden away inside the battery cover. In addition, the



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35 MM REFLEX

The Fries model 435 is a new general purpose MOS production 35mm camera. With its optical printer compatible register pins, steadiness and 150 FPS speed. The 435 is ideally suited for special effects, commercials or any photography where a quality steady image is desired.

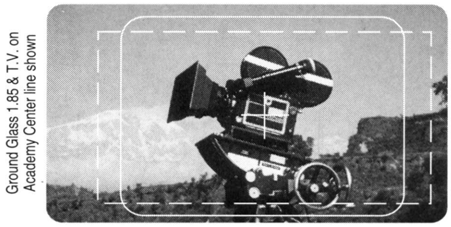
The 435 is a spinning mirror reflex camera with a 170 degree blanking shutter. The internal 30VDC motor runs the camera from 2 to 150 FPS forward and 2 to 50 FPS reverse, in one frame increments all crystal. The camera is equipped with take-up and supply torque motors.

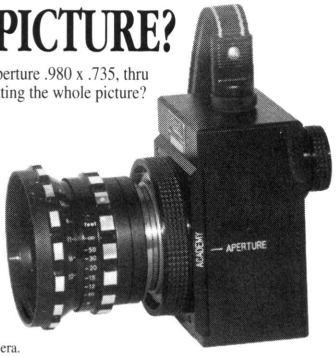
There are both 1000 ft. and 400 ft. displacement type magazines. A new feature is the light valve which allows the operator to direct all the light to the viewing system, or to the video assist, or combo which splits the light between both viewing and video assist.

35 mm, Reflex Camera

WHY NOT SEE THE WHOLE PICTURE?

The new Fries Director's Viewfinder allows the director to view the full camera aperture .980 x .735, thru the same lenses that will be used on the camera when filming. Why aren't you getting the whole picture?





Film Clip: The finder has a set of register pins that will hold a film clip the same as the Fries camera.
Groundglasses: Interchangeable. The same groundglass as is used in the Fries 35R and 35R3 cameras.

Director's Viewfinder

Fries Engineering designs and manufacturers special effects cameras and conversions in 35mm, 65mm and Vistavision including high speed, time lapse and motion control.
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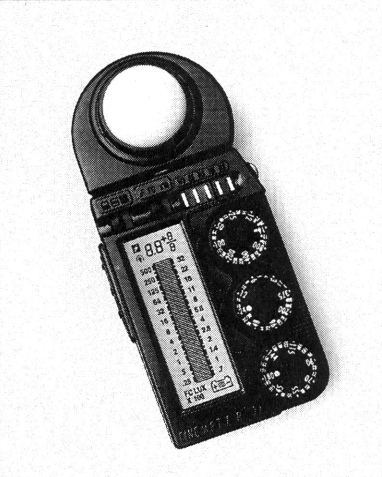
large and easy-to-read LCD data panel lights automatically in low light.

The ambi mode is for shutter-priority measurements of ambient light. This mode should be used when taking measurements under flickering light sources such as fluorescent lights, which may be mistaken for a flash light source in auto mode. The ambi Fno mode is for aperture-priority measurements of ambient light. The flash mode is for single-burst measurements when the meter must be left in position and cannot be operated while the flash is fired. The flash multi mode is for cumulative measurement of multiple flash bursts.

The Flash Meter V is equipped with calculation functions for Average, Shadow or Highlight. Average can be used for both incident and reflected light measurements. Shadow and Highlight can be used for reflected light measurements only. Average displays the average of up to eight readings stored in memory. Shadow decreases the exposure by 2.7 stops (user-adjustable to -4 stops) to produce a reading that will render the measured area as a shadow in the photo. If several points have been measured, the value for the darkest measurement point will be selected. Highlight increases the exposure by 2.3 stops (user-adjustable to +4 stops) to produce a reading that will render the measured area as a highlight in the photo.



Other performance features include an ISO button for Polaroid test films, brightness difference readout, and memory that can store up to eight measurement values. The Flash Meter V can be set to measure illuminance for normal photographic readings, for cinematogra-

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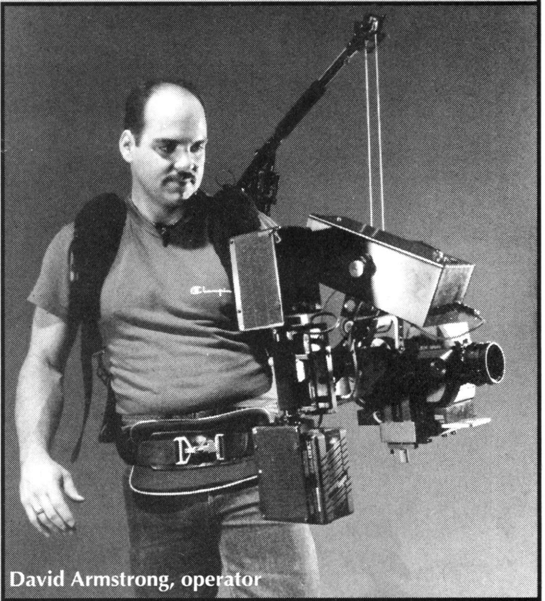

David Armstrong, operator

- Model L for Film and Video Camera Packages Weighing 15 to 25 lbs.
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U.S. Patent No. 4,206,983

phy use with framing rates of 8, 12, 16, 18, 24, 25, 30, 32, 64, or 128 fps, or for illuminance-only measurements with displays in lux or footcandles.

For information: Minolta Corporation, 101 Williams Drive, Ramsey, NJ 07446-1293, (201) 825-4000.

VIDEONICS
EDIT SUITE

Edit Controller

Videonics' Edit Suite A/B roll edit controller, when used in conjunction with Videonics' MX-1 Digital Video Mixer, is capable of either manually or automatically controlling up to four source VCRs and a recording VCR, effectively making it an A/B/C/D edit controller. It is also compatible with other third-party mixers. (When used by itself, Edit Suite operates as a single source, cuts-only editor with two separately programmable GPI ports.) Advanced features such as separate audio or video inserts, audio and video split ends and video edit preview/review are supported when connected to VCRs containing these capabilities.

A weighted, professional quality jog/shuttle wheel provides accurate and positive control of videotape, whether it's advancing at 10X play speed or frame by frame. By adding a Videonics TitleMaker 2000, users can include professional-style titles in their productions as well.

Other features include the capability of storing EDLS with up to 250 edit segments; support for Sony Control-L, Panasonic Control-M, RS-232 and RS-422 VCR control protocols as well as VITC, LTC and RC time codes; a computer interface that allows EDL export for CMX compatibility, which allows offline work to be later transferred to more costly online suites; and an adjustable backlit LCD display.

For information: Videonics, 1370 Dell Avenue, Campbell, CA 95008-6604, (408) 866-8300, FAX (408) 866-4859.

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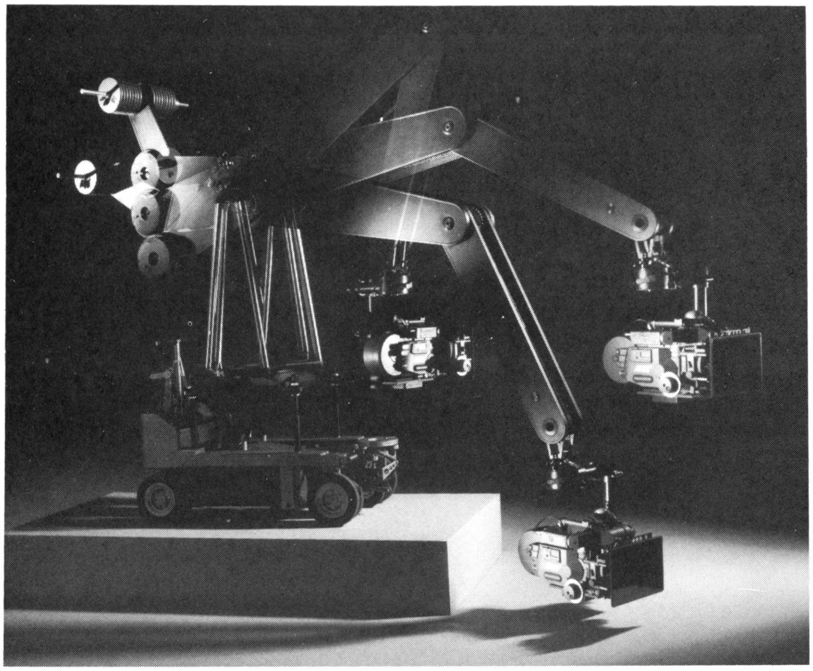

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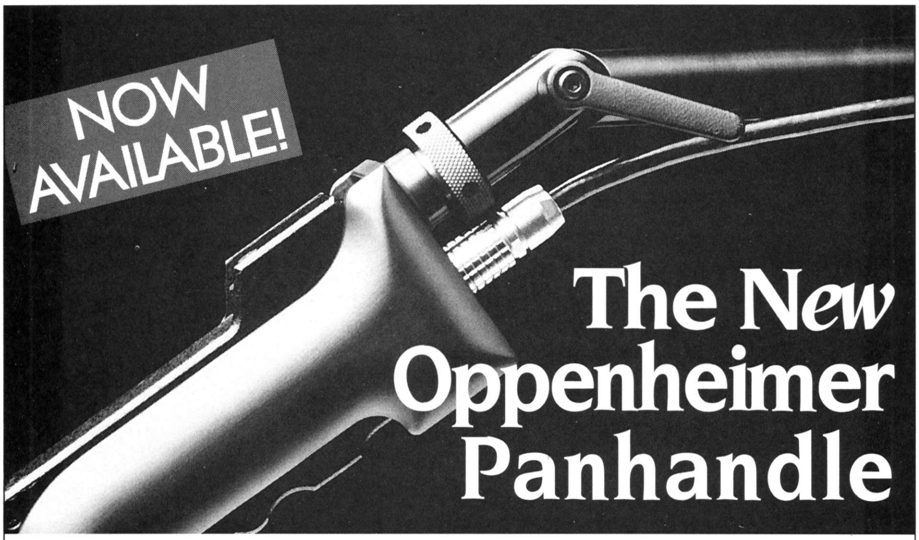

Oppenheimer Camera proudly announces the arrival of the **new *articulating* version** of our popular Oppenheimer Panhandle for the Microforce Zoom control. The Oppenheimer Panhandle has become the standard at the world's best rental houses and it is usually requested by name!

Our attractive, ergonomic design has been copied, but not equaled. We can interface with fluid heads manufactured by Sachtler, O'Connor, Cartoni, Ronford, Vinton, & Weaver-Steadman.

And our hand-held attachment allows you to use the Oppenheimer Grip with the Microforce control as a right-hand grip on 16/35mm Aaton & Arriflex, and 35mm Moviecam cameras.

The new, improved version is now in stock. During April and May, we are offering an ***Articulating Version Trade-up Program*** for current owners of the Oppenheimer Panhandle. Call or fax us in Seattle for details. If you are not currently using our system, let us tell you how it can help make your operating easier.

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Sony's DVW Line:

Electronic Cinematography in a New Light

by Brooke Comer

Although television is electronic, much of its programming originates on film. Why isn't it originating on a direct 525-line electronic system? Maybe it will, now that Sony has unveiled the DVW-700 digital camcorder and its analog sister, the DVW-600. Sony's "shoot and capture" Digital Betacam camcorder is the latest innovation in electronic cinematography, the first one-piece 4:2:2 component digital camcorder. It also combines the industry's highest performing 525-line CCD imager with the latest advances in Digital Signal Processing, not to mention the digital component VTR — all in a 15-pound package.

Rob Draper, one of the cinematographers who tested the DVW-700, said that "if I'd been shooting on film instead of tape, I'd have lit exactly the way I did on this video camera. I made no compromise at all in terms of lighting levels, or the contrast ratios I used. But on a film camera, I'd have needed a lot of filtration, more than I did on this camera. In fact, we used no filtration at all."

The idea of the DVW-700 is to preserve the original picture and sound quality through editing and distribution. Digital processing gives the picture and audio signals more stability and quality. The 700 is the widest bandwidth portable component 525-line VTR ever built. It even surpasses the D-1 digital component video recorder in its ability to record the full exposure latitude capability of the CCD camera.

On the outside, the 700 looks like your average camera. But inside, it's a whole new ballgame. The design of the tape compartment, for instance, is very different — it's sideways. But that's because cassette insertion in this manner allows less dust to invade the camera. It's also quieter, and does not require a color playback adapter.

In order to get the wide dynamic range and picture quality that impresses film shooters, the DVW-700 uses 10 bit A/D converters for the RGB output signals of the CCDs. To maintain this quality, the signal processing is done at more than 10 bits with a maximum of 14 at 36 MHz.

Both the 700 and the 600 have a smart card, which is plugged into the side of the camera and reproduces a camera setup, thus saving time, especially when multiple cameras are involved. "Every time I use the camera, I am happy," says Michael V. deGruy, a cinematographer, director and producer who specializes in underwater, documentary and wildlife filmaking. DeGruy tested the digital camcorder during a travel commercial montage shoot in the Cayman Islands.

"I know I can plug that card in and have the same setup that I tweaked and played with and finally got that shot I liked so much on the last shoot. I can store it and carry it over to the next shoot and have the same setup, which is fantastic and truly changes my attitude toward video in an extraordinary way. I no longer have to futz around to get an image I can live with."

Depending on the needs of a given shoot, the 700 can be ordered in standard 4:3 or 16:9 image format. The half-inch cassette records for up to 40 minutes, but the rechargeable battery gives it the ability to work for up to two hours.

But what about the "film" look? Exposure latitude is one of the factors that give film its edge over video. Modern film stocks have a total exposure latitude of about 9 1/2 f-stops. Each end of this latitude is bounded by "knee" and "toe" exposure chracteristics that cinematographers exploit for artistic effect. The new Sony camcorders use Hyper HAD CCD technology to capture an exposure latitude of about 10 1/2 f-stops, while the new 525 line camcorder has an exposure latitude of more

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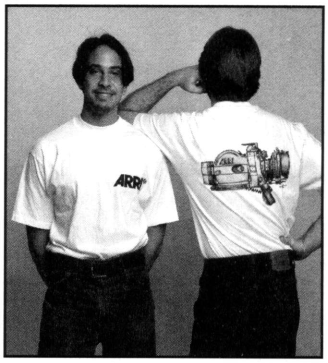

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Exposure index is another critical area. The Sony CCD cameras with low noise performance achieve an effective exposure index of 580 in studio tungsten light and an even higher EI in daylight.

Director of photography Mike Slovis filmed a Norma Kamali beauty infomercial at Empire Studios in New York with the BVW D600 Betacam SP camcorder. The shoot occurred about five months before the BVW's digital sister, the DVW, was ready. Peter Gloeggler, Sony's product manager for portable cameras, told director Tarquin Cardona that if he was willing to accept a wire running around the floor, he could use the BVW-600 Betacam SP camcorder and take the component signal from it into a Digital Betacam Studio VTR. Cardona was attracted to the Sony camera's 1,000 lines of resolution. "We were nervous at first," says Cardona, "because the show was about beauty and we wanted to make sure you could really see the skin."

Slovis found that the camera fit the project well. "Norma's concept was to redefine the way that people look at beauty," Slovis explains. "It wasn't about putting layers of makeup on someone's face. The idea was to photograph people with diffusion, without fancy lighting, without makeup, and show that with healthy skin, they look their best."

Because of the digital processor on the front of the camera, Slovis could do things he couldn't have achieved on a regular Betacam. He especially appreciated the skin tone detail function. Slovis notes that skin tone enhancement is something that takes away detail specifically in flesh tone. "Not that we wanted to hide anything," he adds. "But it lent a little bit of extra smoothness on the skin without degrading the image."

Thorpe adds that a script that requires the "CCD look" is obviously at an advantage when shooting on an electronic system. But Thorpe makes it clear that Sony is not promoting their new electronic system as the new alternative to film. "We tell producers that it's really up to the creative people, and what kind of look they achieve. We never say that film is dead because we have a new product."

Books in Review

by George Turner

Burning Passions
by Paolo Cherchi Usai
British Film Institute and
Indiana University Press,
128 pps., cloth $39.95,
paper $19.95

Talk about a misleading title! No, this isn't a book you'd have to carry home in a plain wrapper; it is a scholarly and informative look at the silent movie from technical and artistic viewpoints. The subtitle is "An Introduction to the Study of Silent Cinema," but this, too, fails to convey what the book is about.

What it is *not* is the usual director-oriented study of individual productions. Much of it concentrates upon the very thing most silent film books do little more than touch upon: the physical characteristics of early movies. This includes the chemistry, formats, methods of coloring, special characteristics of the film stocks, projection equipment, projection speeds, live music and sound accompaniment, printing, etc.

Much of the text is devoted to discovery, preservation, identification and exhibition of silent films from both aesthetic and practical points of view. There is good information for the serious researcher on the etiquette of dealing with archives and the handling of rare archival materials. The approved way of studying silent films presented here is a purist approach, which is okay for anyone who has the time and money to go to the great film archives of the world to study films. If we observed all of the strictures set forth here, most of us wouldn't get to see very many of them.

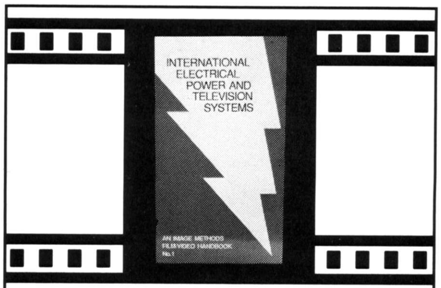
There aren't many picture pages, but the selections are choice and rare. There are 30 actual-size photos of film clips in formats used from 1895 to 1927, ranging in widths from 9.5mm to 75mm and with an astonishing variety of sprocket holes. Equally interesting are 18 frame blowups of various kinds of color film including tinting, toning, tinting-toning combinations, mordanting, hand-coloring, the Handshiegl process, the Friese-Greene three-color system, 1922 Kodachrome, and others.

Add edge mark guides, a list of archives the world over, film measurement tables and a foreword by Kevin Brownlow and it becomes obvious that this slim book is packed with information. It's not stuff for the casual reader, but for the serious film lover it's a knockout.

World Cinema:
Diary of a Day
Edited by Peter Cowie
Overlook Press, cloth,
400 pps., $27.95

As a celebration of the 100th anniversary of the exhibition of projected motion pictures by the Lumiére brothers in Paris on December 28, 1895, the British Film Institute asked 1,000 working members of the film industry to record a diary of what they were doing on a specific day. The day chosen was Thursday, June 10, 1993, and the project was called "One Day in the Life of World Cinema." Peter Cowie, one of the good guys among film writers (yes, there are a few black hats among us), has edited the resulting quotes into a hefty volume and illustrated it with some 320 photos, adding up to what he calls a "snapshot" of moviemaking on all continents.

As edited, this vast mélange of information is not as chaotic as one might expect. The diaries have been gathered into 25 chapters in which persons involved in various stages of production are grouped. They run the gamut from preproduction to postproduction and include most of the key people both above and below the line. These consist of directors, producers, executives, writers, agents, actors, cinematographers, soundmen, visual effects artists, production designers, composers, costume designers, editors, composers, casting directors, critics, archivists and others. The blockbuster names include Michael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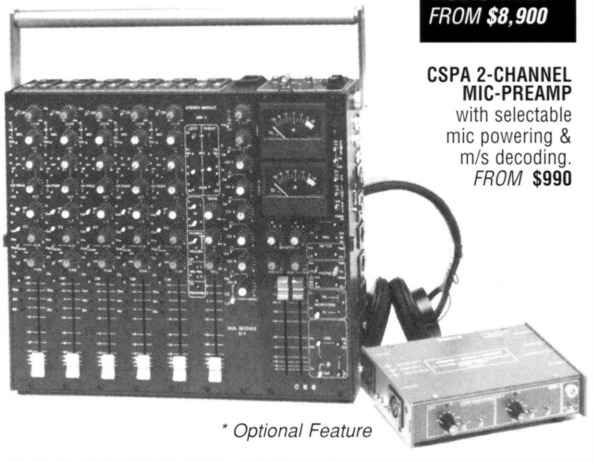

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Cinematography lovers will be especially fascinated by Chapter 14, "Behind the Cameras," which includes the diaries of a variety of art, music and technical professionals, including cinematographers. The latter are: Vittorio Storaro, AIC, ASC, from location in Palmyria; Giuseppe Rotunno, AIC, ASC in Los Angeles making *Wolf;* Felix Monti in Argentina; Peter Suschitzky, en route to Australia; Jaromir Safr in Czechoslovakia; Kenji Takama in Japan; Peter Pilatian in Wisconsin; Allen Guilford in New Zealand; and Suminda Weerasinghe in Sri Lanka.

This major opus proves once again that filmmaking is truly a global art.

Set Lighting Technician's Handbook

by Harry C. Box
Focal Press, 293 pps., paper, $34.95

Although this useful item in the Focal Press series of motion picture technical books is intended for students and beginning professionals in the set lighting field, it's a dandy one for anybody who works on the set. A case in point is the excellent glossary. While terms like t-bone, pole cat, dot, duckbill, and meat ax are part of the daily lingo of lighting technicians and the people who are accustomed to working with them, they may be confusing to others.

A pro in the field, Box presents a raft of practical dope about the practices, tools and equipment of set lighting. In addition to the essentials of operating with HMI, PAR, arcs and fluorescent lights, there's a long look into exotic and unusual lights. Ways of manipulating light, maintaining correct color temperatures, and keeping light flicker-free are well covered. Electrical distribution and safety procedures are discussed in depth. Besides providing expert technical information, Box goes into some areas not often touched upon in manuals, such as set protocol, union contract rules, and lighting for rain, underwater sets and other unusual situations.

There are a wealth of tables (about 100) and 150 illustrations that really do speak louder than words.

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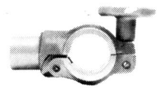

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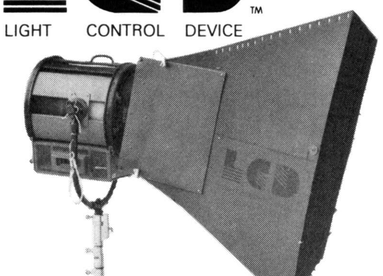

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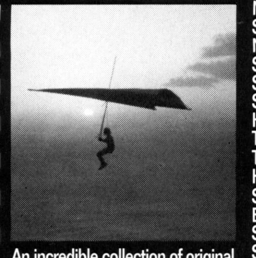

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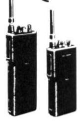

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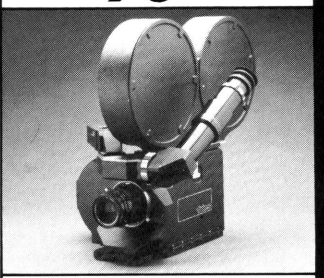

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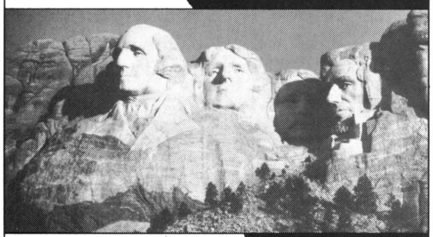

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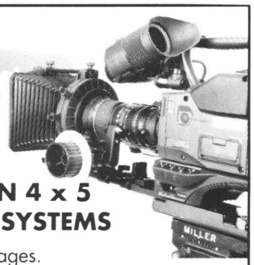

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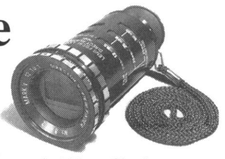

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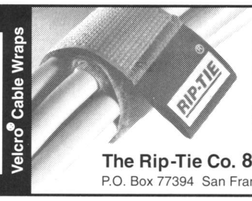

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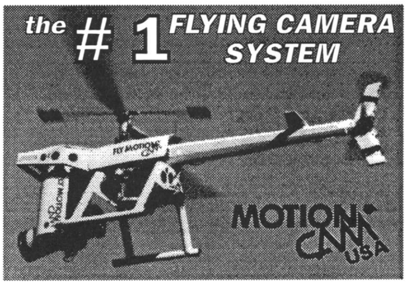

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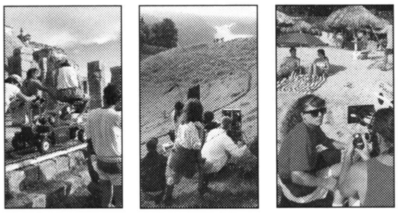

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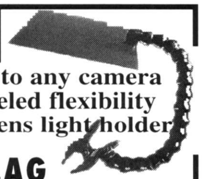

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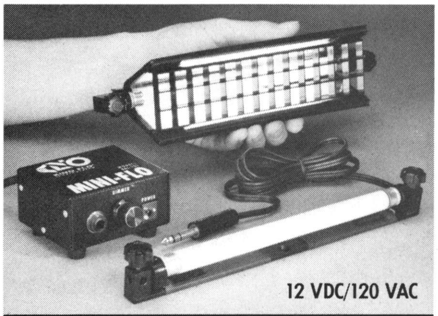
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In Memoriam

Edward Colman, ASC cut his teeth on silent slapstick comedies and was making matte shots and photographing miniatures when those kinds of movie magic were performed in secret. Long after being established as a leading special effects photographer in the United States and Europe he decided to "start over" as a production cinematographer. After the arrival of television he joined Jack Webb in pioneering the ultra-realistic style that became an integral part of police shows. He photographed many of the Disney live-action features, including the exquisite *Mary Poppins.* This man, who one writer called "the compleat cinematographer," died on January 24, 1995.

Colman was born in Philadelphia in 1905 and came to Los Angeles in 1918. Six years later, while attending high school, he was hired as an assistant cameraman for Barney McGill, ASC at Educational Studios, specialists in two-reel comedies. Like most comedy photographers, he became adept at special effects photography. He later freelanced as a second cameraman and in 1927 was hired by Ned Herbert Mann, director of special effects for United Artists, as a director of photography for all the visual effects for the various UA producers. These included *Tempest, Alibi, The Bat Whispers,* and *Hell's Angels.*

When British producer Alexander Korda hired Mann in 1935 to head his special effects department, Colman joined him and for three years worked on a string of elaborate prestige films, including the H. G. Wells spectacles *Things to Come* and *The Man Who Could Work Miracles,* and the fantastic *Thief of Bagdad.* Upon returning to the States in 1938 he decided to concentrate on production cinematography. Demoting himself to operator, he went to Universal for three years as operator for George Robinson, ASC, on numerous pictures including *Son of Frankenstein, Tower of London* and *The Sun Never Sets.* In 1947-8-9 he worked with Joseph Valentine, ASC on *The Magnificent Doll, Possessed, Sleep My Love* and *Joan of Arc.*

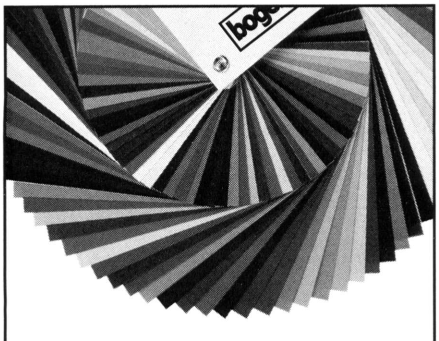
In 1952 Colman became an operator on Jack Webb's *Dragnet,* one of the first successful dramatic series on TV. Webb soon made him his director of photography and gave him a full frame credit. Colman photographed 295 *Dragnet* segments in seven years, as well as the first color series, *Noah's Ark* (26 episodes), 26 segments of *The DA's Man,* and 13 *Pete Kelly's Blues* programs. He made three features for Webb: *Dragnet, The DI,* and *-30-.* He also began filming TV specials for his friend, Walt Disney, and in 1959 made his first Disney feature, *The Shaggy Dog.* Other Disney features followed during the next ten years: *The Absent-Minded Professor, Babes in Toyland, Big Red, Son of Flubber, Savage Sam, The Misadventures of Merlin Jones, Those Calloways, The Monkey's Uncle, The Ugly Dachshund, The Adventures of Bullwhip Griffin, The Gnome-Mobile, The Happiest Millionaire, Blackbeard's Ghost,* and *The Love Bug.*

Colman's personal favorite was *Mary Poppins* (1964), which contained a wealth of artistic settings and sophisticated visual effects. He used the new sodium vapor matte process extensively.

The Love Bug (1969) was his 15th Disney feature. "After that I decided I didn't want to be the richest cinematographer in Forest Lawn, so I quit," Colman said. "I was a participant in many innovative events during my career. From the hand-cranked Bell & Howell to the sophisticated cameras of today; from the slow, color-blind orthochromatic film to panchromatic emulsions; incandescent lamps replacing the banks of Cooper-Hewitt tube lights and smoky Kleig and arc lights; sound films replacing the old silents; old mechanical optical printers in lathe beds evolving to computerized and electonic printers; the advent of television in the studios; the change from black & white to all-color film, and many other changes.

"All in all," he concluded, "I enjoyed every moment of a long, rewarding and most interesting career." Colman and his wife, Phyllis, retired to a beautiful hillside home in Mission Viejo.

Colman's younger brother was the late Bernard Colman, ASC. His first wife, Mary, daughter of John W. Boyle, ASC, died after 48 years of marriage. He is survived by his wife, two daughters, Lu Ann Lofton and Susan Acosta, five grandchildren and two great grandchildren. —G.T.



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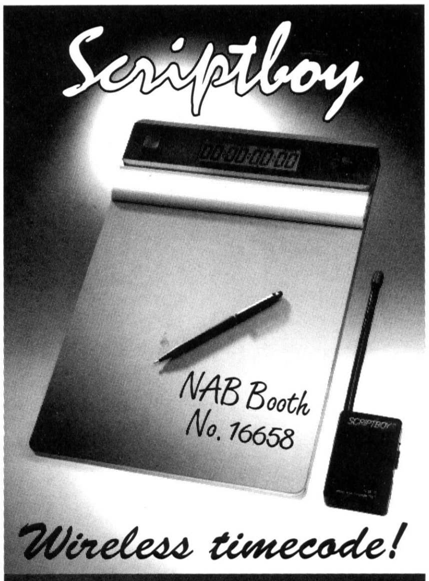

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Continued from page 120

complished in various ways. Most all 35mm photography is accomplished with a camera with a full "silent" 1.33 aperture. As a matter of studio policy or of personal choice, a film composed for display in 1:85 ratio may be shot with this full silent 1.33 aperture or with the reduced Academy (sound) 1.37 aperture, or even with a 1:66 hard matte or a 1:85 hard matte. All are intended to be displayed as a 1:85 image. A 2.4 anamorphic film is shot with an aperture which is nearly square. This illustrates the difference between a production standard and the presentation of the intended displayed aspect ratio of a film. We should remember that 16:9 was set as a production standard for analog HDTV production and was chosen with the understanding that the end product might well be 1:85 film. It was never sanctioned as a display standard for the general public or considered to be an accurate presentation of previously photographed materials.

A recent address at an engineering conference stated that the ASC was interested in protecting artistic integrity while those in the engineering community believe in "protection of investments already made in equipment." This often-repeated defense of 16:9 refers to the possibility of tens of millions of dollars having been prematurely spent and wasted by equipment manufacturers tooling up picture tubes for 16:9 in advance of the establishment of an American HDTV standard. Of course, the standards are yet to be approved and every other element of the original 16:9 production standard has been replaced or modified during the ensuing lapse of time. Tens of millions of dollars? Well, just the other evening I talked to a fellow cinematographer who personally had shot film productions representing budgets totalling more than 500 million dollars. These had generated grosses counted in the billions of dollars. Not one was shot in 16:9, nor was any consideration given to 16:9. Such is the difference between the real world of film production and that of an engineering group isolated from the input of the production community.

This conflict may be simply a reflection of the original lack of appreciation for the importance filmmakers place on the choice of aspect ratios, for both production and eventual display. When a film is produced, a decision must always be made between the common formats of 1.85:1 and anamorphic 2.35:1. In television, no such choice has existed for 50 years and so the tradition is one of accepting the one standard ratio. So naturally, all this fuss is something new and unexpected to those with a television background. Quite frankly, most every engineer with whom I've discussed this seems at a loss to understand what all the excitement is about. The shape of the picture, the scale of the presentation and the intent of the original filmmakers appear to be minor issues.

Because of amazingly rapid progress in the electronic distribution and display of images, the earlier decisions are now seen by many as hurried and inappropriate. Whether electronic delivery of moving images should even be forced into any one limited aspect ratio is certainly open for investigation. Certainly it would be better to have a fully variable aspect ratio that would properly present all existing materials uncompromised in their original proportion and scale, with maximum spatial and temporal resolution.

Previously unrecognized sectors of the marketplace now demand that pre-existing movie materials be available without cropped images. Very recently, high definition, progressive scan, 2.0:1 projected large-scale images have been demonstrated before the SMPTE. The Advanced TV and HDTV proposals as they now stand seem in some respects to be both outmoded and at the same time premature!

I do not think that today the question of aspect ratio can be seen as the relatively simple question it was perceived as in the recent past. Almost all motion pictures made in the last *40 years* are in a ratio *wider* than 16:9. There exists a truly large library of 2.35:1 productions, a significant number of 2.55:1 productions, and even some films of major importance way out at 2.75:1. This leaves 16:9 nearly the most narrow of all formats wider than 1:37! This is not really a good choice for our future.

According to John Belton, when wide screen films were first introduced by Hollywood in the 1930s, every system was standardized at essentially 2:1, with the exception of RKO's Natural Vision at 1:85. According to Belton, the proposed SMPTE 50mm Wide Film standard also endorsed the 2:1 aspect ratio. All these systems, which date back more than 60 years, are wider than "16:9."

The interest of the cinematographer in these issues has developed concurrently with the development of the new technological possibilities and the recognition of the stagnation and limitations of the approach and narrowness of purpose previously established. Perhaps the trouble is signified by those four letters, "HDTV." After all it is no longer specifically high definition *television* that we are approaching; rather, it is the electronic distribution and presentation of moving images.

Let us not sell the American public a limited, expedient and short-lived system. Let us not misrepresent our heritage and the body of work that is the most influential art of the 20th Century. Let us at least widen our horizons and screens enough to encompass the full width of the existing films that will be distributed through the medium of HDTV.

From the Clubhouse

The ASC's newest active member is John Dykstra. At age 22 he worked with Doug Trumbull as part of the team that designed and built models and did special effects photography for *Silent Running.* Dykstra then helped design, build, and use a computer-controlled camera system for the National Science Foundation at U.C. Berkeley. Returning with what was the beginnings of a modern motion-control technology, Dykstra went back to work for Trumbull in the development of amusement park simulator rides.

Dykstra then joined Gary Kurtz and George Lucas to create Industrial Light & Magic, assembling the creative group that won an Academy Award for visual effects. Dykstra also was presented with an Academy technical achievement award for the Industrial Light & Magic facility itself.

Dykstra then founded the special effects company Apogee, where he worked as a producer and visual effects supervisor on the television series *Battlestar Galactica*, which won an Emmy for effects.

Apogee was re-tooled in 1979 with the next generation of visual effects equipment. Dykstra, Doug Trumbull and the visual effects team received an Academy Award nomination for their work on *Star Trek: The Motion Picture.* Dykstra's credits prior to Apogee, in addition to his *Star Wars* work, include effects photography on *The Andromeda Strain* and *Silent Running*, as well as photography on *Voyage to the Outer Planets* in Omnimax format.

In conjunction with Apogee, Dykstra worked as effects supervisor on *Star Trek — The Motion Picture* (along with Trumbull), *Firefox*, *Caddyshack*, *Lifeforce*, *Invaders from Mars*, and *My Stepmother Was an Alien*. The company also worked on *Die Hard II*, *Ghostbusters II*, *Spaceballs*, *Coming to America*, *Radio Flyer*, *Ghost Dad*, *Child's Play*, *Dune*, and *She Devil.*

Filmmakers' Forum

Past is Prologue

by John Hora, ASC

The debate over the choice of an HDTV standard has produced responses from every corner of our industry, representing a wide range of interests and opinions. The history of the debate can be instructive to a degree; it can also be a distraction from the goal of the debate: to provide a lasting framework for distribution of programming that maximizes quality within today's technological and economic capabilities. Personal attacks, recriminations, fingerpointing and blame games are beside the point.

The debate has been particularly acrimonious over aspect ratio. Why were cinematographers not more outspoken or involved earlier in the choice of a format for HDTV? I think it's accurate to say that the entire original attempt to set a standard started more than a decade ago as a belated reaction to the challenge of the 15:9 NHK-Sony HDTV system, which was pretty much already in place. The 16:9 ratio was simply a slight adjustment to this existing and already functioning analog system. In this respect, all the present excitement is somewhat after the fact. The question of aspect ratio was seen in a very narrow context related to a production standard for primarily new material for broadcast or possible transfer to film. The preservation of the format of other pre-existing programming, especially motion pictures, was obviously not a primary concern.

Just a few years ago the phrase "letterboxing" was not widely known and the entire issue was dormant. It was the broadcasters and the equipment manufacturers who were actively involved in most of issues as they were debated. Within this narrow context, other interests were not fully recognized.

As a production standard "16:9" is not as difficult to accept. It is what it is. It can be used to originate programming to be presented as 16:9, as well as to originate programming to be cropped for transfer to film as 1.66 or 1.85. Such programming can even be cropped into 4:3 NTSC, if so desired. When the program is originally photographed, the appropriate aspect ratio(s) can be considered and the compositions created to fit the final presentation, just as with all the other production formats. Arguments primarily arise when material previously shot in aspect ratios differing from "16:9" is forced into the limitations of that format, when "16:9" is used as a display standard.

What is signified by those numbers 16:9? There is more inferred than is immediately evident. Why does the electronic (television) engineering community universally and historically specify aspect ratios in whole number form, i.e. 16:9 and 4:3, while the motion picture community universally use 1.33:1, 2.35:1, 1.85:1, etc.? The motion picture community has always referred to an aspect ratio as a width relative to a constant height of "1," and for good reason. For example, the standard Academy aperture's ratio is not usually referred to as 4:3 but rather 1.33:1 or 1.37:1. When we refer to 1.85:1 it is clear that 1:85:1 is to be presented as a wider image than 1.33:1, and 2.35:1 is clearly wider than 1:85:1. The width of the display is proportionally increased to present "Wide Screen" images. This is the original concept of the Wide Screen; Wide Screen meant Big Screen and Big Pictures. The bigger the number signifying width, the wider the image to be displayed and the bigger the screen. Very direct, very meaningful, and quite clear.

Can you imagine 20th Century Fox demonstrating CinemaScope to the trade for the first time in 1953 and showing a picture no wider than the existing 1:33 screen but only half as high? Never do we think of 2.35 as being the same width as 1.33. (Yet this is exactly what letterboxing does!)

How much wider is a 16:9 image than a 4:3 image? Well, it might not be any wider at all! To specify an aspect ratio of 1.78:1 as "16:9" infers that it is only a ratio of relative width to relative height without reference to scale, without necessarily meaning any "wider" than, for example, 4:3. It might refer to the same height as 4:3 and therefore be wider, or maybe it might stand for the same width and less height (letterbox), or then again it could be some compromise which is a little less tall and a little bit wider. In publicity releases the numbers "16:9" are meant to sound quite impressive and large compared to "4:3," when in actual fact the aspect ratio is only slightly wider at best.

If theatrical motion picture images are to be properly presented as intended by their creators, they must have a common height. Only the width should be increased in accordance with the ascribed aspect ratio. Without resorting to pan-and-scan or to the reduced height and scale of letterboxing, the proposed 16:9 format can only present 1.33:1 and 1.66:1 ratios! The 16:9 ratio is simply too narrow to accommodate any Hollywood film shot in the last 40 years without some compromise, and far too narrow for presenting common CinemaScope and Panavision films!

Unless the aspect ratio of HDTV is as wide as the widest probable program material, the presentation of material with a wider format will be compromised, either by the truncation and elimination of some of the image, or by a reduction of the scale of the presentation. The height will no longer be "1". A 1.85 image in a 16:9 frame has a height of 96% of the image — not too bad. However, anamorphic 2.35 is reduced in height to 76% of "1". To show *The Robe*, *East of Eden*, or any of the full 2.55:1 CinemaScope films requires 30% of the height of the 16:9 frame to be wasted. The loss of 30% of the height results in lost resolution and the waste of precious bandwidth.

So, where did this 16:9 come from anyway? What are the origins of a single aspect ratio in which to stuff the work of all directors and cinematographers, past, present and future? The 16:9 format was not derived from practice in the "real world." Rather, it was an attempt to create an ideal new format using mathematical formulae. According to the unidentified "Masked Engineer" of TV Technology Magazine, it was quickly and unanimously accepted at a meeting which purportedly included several cinematographers. There are other versions of what happened that fateful night. The point, however, is that the decision seems to have been made without actively soliciting any formal discussion from organizations within the film production community. No representatives of groups of directors, producers, cinematographers or art directors particpated.

The 16:9 aspect ratio is the only parameter of the HDTV system which has not had revision or further investigation. Everything else has been changed. Why did the committee find it so easy to agree on 16:9? I would suggest that the choice of aspect ratio is at its roots an aesthetic one. It has an established history in film practice and is foreign to the customary work of electronic engineers. It remains a complicated question with no single expedient answer. The defense of 16:9 is always simply: "We already have settled it and everyone else is too late! Please go away."

None of the defenders of 16:9 deny that a wider aspect ratio would more accurately present motion picture images as they have been photographed for the last 40 years. None of these defenders of 16:9 deny that essentially no body of work has ever existed in this aspect ratio. No one seems to be able to defend the seeming arbitrariness of choosing a ratio less wide than that nearby standard of 1:85. After all, the majority of films are framed for 1.85. Any existing ratio would be more defensible than a new one that fits nothing!

The recent diatribe by the previously mentioned engineer, who prefers to wear a mask, attacked those who are opposed to 16:9 with a confused recitation of various available camera apertures lifted from the American Cinematographer Manual. What was not understood was that the same intended displayed aspect ratio may be ac-

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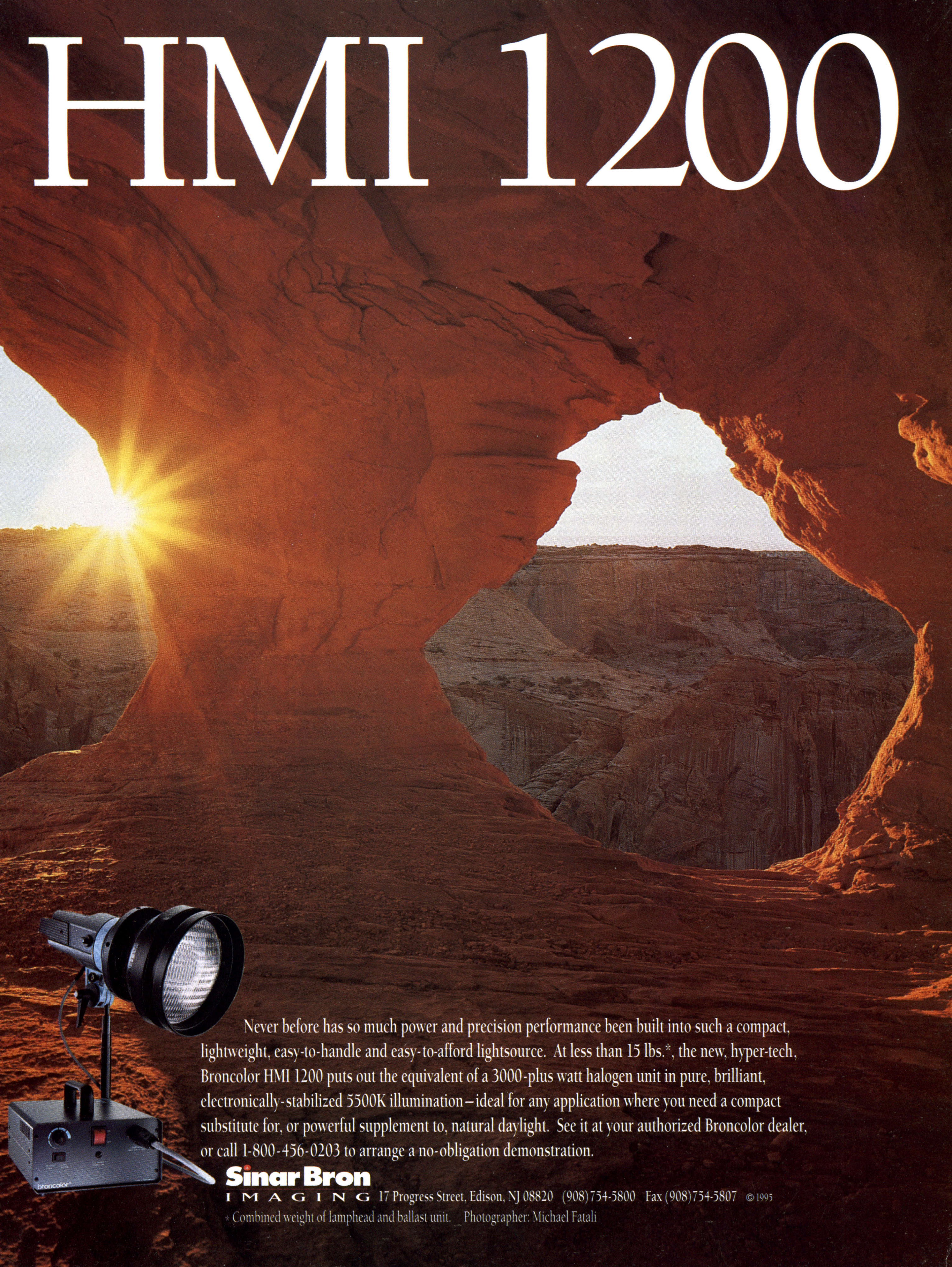

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GamFusion®

GamFusion 10-10 • Almost clear, hardly perceptable diffusion to even light beam & slightly soften edge. Full barndoor & shutter control.
Spot intensity 92% (–1/8*f* stop). Flood intensity 85% (–1/4*f* stop).

GamFusion 10-20 • Slightly diffused, smooths beam with minimal softening of edge. Shutters and barndoors still work well.
Spot intensity 90% (–1/8*f* stop). Flood intensity 82% (–1/4*f* stop).

GamFusion 10-30 • Ideal for use in followspots. Softens hard edges of the spotlight.
Spot intensity 89% (–1/8*f* stop). Flood intensity 76% (–1/2*f* stop).

GamFusion 10-40 • Softens the edge and smooths the beam. Light scatter apparent. Barndoor & shutter control affected.
Spot intensity 88% (–1/4*f* stop). Flood intensity 64% (–1/2*f* stop).

GamFusion 10-50 • Softens the beam, spreads the light. Clearly effects barndoors and shuttering of light.
Spot intensity 85% (–1/4*f* stop). Flood intensity 45% (–1*f* stop).

GamFusion 10-60 • Beam still apparent but edges very soft. Barndoor and shuttering effected with resulting soft light quality.
Spot intensity 75% (–1/2*f* stop). Flood intensity 24% (–2*f* stops).

GamFusion 10-70 • Beam is hardly perceptable. The light is very diffused and wide. Barndoor & shuttering dramatically effected.
Spot intensity 52% (–1*f* stop). Flood intensity 7% (–5*f* stops).

GamFusion 10-75 • Almost total elimination of beam, shuttering and barndoor edges.
Spot intensity 28% (–2*f* stops). Flood intensity 3% (–5*f* stops).

GamFusion 10-80 • Eliminates beam edges. Barndoor and shuttering are not apparent. The light is totally diffused
Spot intensity 20% (–2*f* stops). Flood intensity 2% (–6*f* stops).

GamFusion 10-90 • Total diffusion. No apparent edges. Ideal for light boxes where camera or audience will look into the light source.
Spot intensity 14% (–3*f* stops). Flood intensity 1.5% (–6*f* stops).

Superior Quality DIFFUSION MATERIALS from the Manufacturers of GamColor® & CineFilters®

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